

Tucson Iron & Metal

Custom Incineration

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February 1, 2021

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DEPARTMENT OF
ENVIRONMENTAL QUALITY

Tucson Iron and Metal
Contraband Incinerator-Class II Air Permit #127
NSPS EEEE Semi-Annual Report and
2020 Title V Annual Compliance Certification
Tucson, Pima County, Arizona

Dear Mr. Patel:

Pima County Department of Environmental Quality (PDEQ) is in the process of issuing the renewal of Title V air permit no. 127 Tucson Iron & Metal (TIM) Air Quality Operating Permit #127, a Class II permit for an aluminum sweat furnace and the other solid waste contraband incinerator (OSWI) unit. The Tucson Iron & Metal units are located at 4484 E. Tennessee, Tucson, Arizona 85714.

The sweat furnace is subject to National Emission Standards for Hazardous Air Pollutants (NESHAPS), Subpart RRR, for secondary aluminum production. The sweat furnace was shut down in February 2015, after about 16 hours of operation, and did not operate for the rest of 2015 and has not operated from 2016 through the end of 2020. During the report period from July 1 through December 31, 2020, the sweat furnace did not operate but was maintained. An inspection of the aluminum Sweat Furnace afterburner during the report period was completed and a report prepared for filing with PDEQ. I certify there were no excess emissions from the TIM Aluminum Sweat Furnace during the entire report period of 2020.

After PDEQ notified TIM that the contraband incinerator was subject to NSPS EEEE in 2016, TIM has provided PDEQ required notices during each semi-annual report period since the 2016 notification (including annual certification reports and notices required under NSPS §60.7 and NSPS EEEE). The report for the first semi-annual report period for 2020, filed with PDEQ dated July 28, 2020, and supplemented on September 30, 2020, are incorporated by reference into this report for the purpose of the annual compliance certification.

In addition to the applicability of NESHAPS RRR to the sweat furnace, the TIM air permit #127 renewal reflects the applicability of the federal New Source Performance Standards (NSPS) for Other Solid Waste Incineration (OSWI) Units for Which Construction Commenced After December 9, 2004 or for Which Modification or Reconstruction is Commenced on or After June 16, 2006 (40 CFR Part 60, Subpart EEEE) and NSPS Subpart A, General Conditions.

This letter includes the second semi-annual report of 2020, for the period from July 1, 2020, through December 31, 2020, for the TIM facility operations and the required Annual Certification required under Title V for the OSWI unit. As previously reported, the contraband incinerator unit was updated to meet NSPS EEEE requirements.

NSPS Subpart EEEE, section 60.2951 requires an Annual Report as listed in Table 4, Summary of Reporting Requirements. No later than 12 months following the previous report the reporting requirements include, in addition to the company name and address and the statement of the owner: (1) values for the operating limits, (2) dates and times of each deviation if any, (3) highest and lowest 12-hr and 3-hr average CO data, (4) all CO 1-hr average concentrations, (5) identification of dates and times when CO CEMS was inoperative, malfunctioning or out of control (OOC), other than during calibrations, (6) duration and causes of each deviation or operating parameter not measured and corrections, (7) dates, times and duration of malfunctions and corrective actions, and (8) dates and times for which monitoring data shows a deviation from CO emission or operating limits with a description of reasons for the deviation and corrective actions.

Included with this Annual Report are the two Semi-Annual Reports showing: (1) dates and times of deviations, (2) average and recorded data for those dates, (3) duration and causes of each deviation and corrective actions taken, (4) copy of operating limit monitoring data and any test reports, (5) CEMS downtime incidents, (6) whether a deviation occurred during a period of startup, shutdown or malfunction, and (7) dates, times, and duration of any bypass of the control device.

The TIM air permit #127 renewal includes responses to all of the federal rule provisions. The original Title V federal operating permit (FOP) application was filed with PDEQ and U.S. EPA Region 9. PDEQ previously issued operating permit #127 in 2010. The timing of reports required under the Title V permit were adjusted to a calendar year basis to coincide with reports required under NSPS EEEE and NESHAPS RRR.

TIM has had no deviation of the regulatory Operator Training and Qualification requirements. The original facility Qualified Operator was certified as required under Subpart EEEE, §§ 60.2905 through 60.2907 and the Qualified Operator conducted every contraband burn at the TIM-Tucson facility during the report period. The qualified OSWI unit operator of the TIM-Tucson contraband incinerator facility completed the annual review, required under §60.2908, to maintain qualification on May 23, 2020.

Subpart EEEE regulations require reports of deviation from the emission limitations or operating limit requirements, a record of the duration and causes of each deviation and the corrective actions taken. Records of operating limit monitoring data during each deviation has been kept at the site and a record of the dates, times, and causes for monitor downtime incidents, whether each deviation occurred during a period of startup, shutdown, or malfunction, and the dates, times, and

duration of any bypass of the control device. NSPS Subpart EEEE, section 60.2918 states that "The emission limitations and operating limits apply at all times except during OSWI unit startups, shutdowns, or malfunctions." The TIM-Tucson facility has no means during normal operation to bypass the facility emissions control devices.

All contraband for disposal in the TIM contraband OSWI unit were received at the site by delivery from federal or state law enforcement agencies, either the U.S Customs and Border Protection (U.S. C&BP) service, the federal Drug Enforcement Agency (DEA) or Tucson Police or Sheriff Departments. All contraband was completely burned to ash and the ash was removed from the unit after the burns were complete. Ash was collected and cooled in steel containers and disposed as non-hazardous industrial waste at an authorized waste facility site.

2020 First Semi-Annual Report Period – 01.01.2020 through 06.30.2020:

For the period beginning January 1, 2020, through June 30, 2020, TIM conducted a total of 14 burn days; the duration of all of these burns totaled 79.65 hours (see attached Table 2). The monthly distribution of hours of contraband burning was as follows:

Tucson hours per burn January-June 2020

January		February		March		April		May		June	
Day	Hours	Day	Hours	Day	Hours	Day	Hours	Day	Hours	Day	Hours
22	4.50	27	6.83			21	3.67	7	6.17	3	6.33
						22	6.33	12	7.50	4	2.25
								26	3.00	16	6.00
								27	5.25	17	2.83
										18	8.83
										23	6.33
										24	3.83
4.50		6.83		0.00		10.00		21.92		36.40	

January-June Total Hours: 79.65

Total Days: 15

It should be noted that the CO emission rate limit based upon the NSPS Subpart EEEE emission limitation of 40 ppm @7% oxygen, is 1.29 lb CO/hour. Based upon 79.65 total hours of contraband incineration during the first half of the year, the compliant amount of CO, @7%O₂, emitted during the report period is limited to (1.29 lb/hour)(79.65 hours) = 102.75 lb CO @7%O₂.

A record of each deviation has been kept at the site and a record of the dates, times, and causes for monitor downtime incidents, whether each deviation occurred during a period of startup, shutdown, or malfunction, and the dates, times, and duration of any bypass of the control device. NSPS Subpart EEEE, section 60.2918 states that "The emission limitations and operating limits

apply at all times except during OSWI unit startups, shutdowns, or malfunctions.” The TIM facility has no designed means to bypass the facility emissions control device. The following sections contain a summary of the CO emission concentrations during the first reporting period of 2020 (please refer to Attachments - ‘Rolling Avg CO Concentration Reports’ as needed):

Deviations of CO Limitations – (01.01.2020-06.30.2020):

The TIM CEMS failed the Relative Accuracy Test Audit (RATA) in April 2019 and was not retested (a departure from a quality assurance procedure) until July 2020 and therefore the CEMS unit was “out-of-control” (OOC) during roughly the first seven months of 2020.

In its July 22, 2020, letter of interpretation to TIM, PDEQ, using EPA guidance to reach an OSWI unit average CO value, the ratio of normal operation hours and startup/shutdown hours, results in 1.76 lb/hour and taking 125% of the “out-of-control” rate, as identified in the attachment to the July 22, 2020 PDEQ letter, results in an OOC value for CO of 2.20 lb CO/hour. TIM used the suggested OOC CO rate by PDEQ for the 2020 1st semi-annual report, as follows:

1-Hour Average CO @7% O₂ Deviations of the 40 ppm CO @7% O₂ Limit:

For the 1st semi-annual report period there were 14 burns with 33 recorded 1-hour average carbon monoxide (CO) @7% oxygen (O₂) emission concentration exceedances during 12 of the burns (the limit is 40 ppm CO) recorded by the CEMS. The 33 1-hour average exceedances occurred when the CEMS was ‘on,’ but ‘out-of-control’ (OOC) resulting in an average of the 1-hour concentrations @ 7% O₂ exceedances of roughly 143.6 ppm CO (see above OOC discussion).

<u>Burn Date</u>	<u>Burn Hours</u>	<u>Number of & Span of 1-Hr Exceedances</u>
01.22.2020	5.5 hours	(6) 1 st , 2 nd , 3 rd , 4 th , 5 th & 6 th hours
02.27.2020	8.1 hours	(3) 2 nd , 3 rd & 4 th hours
04.21.2020	4 hours	(3) 1 st , 3 rd & 4 th hours
04.22.2020	7 hours	(1) 2 nd hour
05.26.2020	3.5 hours	(4) 2 nd , 3 rd , 4 th & 5 th hours
06.02&03.2020	7 hours	(6) 1 st , 2 nd , 3 rd , 4 th , 5 th & 6 th hours
06.16.2020	6.5 hours	(2) 3 rd & 4 th hour
06.17.2020	3 hours	(1) 1 st hour
06.18.2020	8.5 hours	(3) 1 st , 2 nd , 3 rd & 9 th hour
06.23.2020	7 hours	(2) 2 nd & 3 rd hour
<u>06.24.2020</u>	<u>4 hours</u>	<u>(2) 3rd & 4th hour</u>
Σ=11	Σ=64.1	Σ = 33

Many of the hourly exceedances occurred in the 1st or 2nd recorded hour of the burns which indicates the primary chamber was starting to warm, but the afterburner chamber was initially cooled by the exhaust flow from the primary chamber causing

the elevated CO concentrations due to a temporary reduction of destruction efficiency at the afterburner. Several exceedances of the 1-hour average CO concentration limit later during a burn can be explained by high heat causing automatic afterburner trips which result in a cool-off, followed by automatic restarts that recover higher CO destruction efficiency.

Considering the OOC rates (see attached emissions report) there were about 33 1-hour average CO @ 7% O₂ emission concentration exceedances during 12 of the burns (the limit remains 40 ppm CO). For the 33 hours of exceedances during the 79.7 hours of burns during which the CEMS was 'on,' but OOC, resulting in an average of the 1-hour CO average concentration exceedances of about 143.6 ppm compared to the 1st report period average CO 1-hour concentration of 66.2 ppm (see Table 2).

The air permit CO emission allowable is 1.29 pounds per hour (lb/hr) (based upon 40 ppm CO @7% O₂) during hours of normal operation. Applying the OOC CO rate of 2.20 lb/hour to scale the CEMS data up to the out-of-control rate results in a ratio of $(2.20/1.29) = 1.705$. During the duration of the CEMS recorded 1-hour exceedances the mass emission rate allowable was $(1.29 \text{ lb/hr})(36 \text{ hrs}) = 46.44 \text{ lbs CO}$. The average of only the 1-hr average CO OOC emission limit exceedances during the first semi-annual report period was 66.2 ppm. The equivalent mass CO emission during the duration of the report period, above the allowable, was:

$$(66.2 \text{ ppm} \div 40 \text{ ppm})(2.20 \text{ lb/hr})(79.7 \text{ hrs}) = (1.655)(2.20)(79.7) = 290.2 \text{ lbs CO}$$

During the 1st semi-annual report period the compliant amount of CO @7%O₂, emitted is limited to:

$$(1.29 \text{ lb/hour})(79.7 \text{ hours}) = 102.8 \text{ pounds CO @7\%O}_2;$$

so, the 1-hour average CO OOC exceedances resulted in excessive CO emissions for the first 6-month's report period of:

$$(290.2 \text{ lbs} - 102.8 \text{ lbs}) = 187.4 \text{ lb of CO during the 1}^{\text{st}} \text{ report period.}$$

None of the above events resulted in a federal reportable quantity (RQ) of CO emissions (defined as 5,000 pounds for CO).

12-Hour Average CO@7% O₂ Deviations of the 40 ppm CO @7% O₂ Limit:

There were 15 burns during the first semi-annual report period of 2020; only two of the burns had no 12-hour rolling average CO concentration limit exceedances (refer to attached Table 2). Without considering OOC effects, according to the CEMS readings there were 5 burns with no 12-hr rolling average CO exceedances, but 2 burns without 12-hr average CO exceedances when considering OOC rates. The following describes the 12-hour rolling average CO OOC concentrations during the report period:

- During the January 22, 2020, contraband burn, which spanned 7 hours, the 12-hour rolling average CO concentration was exceeded during all of the hours of the burn. The average of the 12-hour rolling average exceedances during those 7 hours was about 145.6 ppm [the OOC CO rate scales the CEMS readings by $(2.20/1.29) = 1.705$].
- During the next 3 burns from the February 27th burn, the April 21st burn and the April 22nd burns, the average of the OOC 12-hour rolling CO averages was about 100.3 ppm.
- During the May 7th five hours burn there were two 12-hour rolling average hours that exceeded the 40 ppm CO emission limit (12-hr rolling avg of 63.3 ppm and 60.7 ppm). The overall average of the 12-hour rolling average CO during the burn was 40.0 ppm.
- There were no exceedances of the 12-hour rolling average OOC CO emission limit during the May 12th 8 hours burn.
- During the May 26th four hours burn, 5 hours of the 12-hour rolling average hours exceeded the 40 ppm CO emission limit. The overall average of the 12-hour rolling average CO values during the burn was 44.9 ppm.
- During the June 2nd burn of one hour there was one 12-hour rolling average hour that exceeded the 40 ppm CO emission limit (12-hr rolling avg of 71.5 ppm). The average of the 12-hour rolling average CO during the burn was 71.5 ppm.
- During the June 3rd six hours burn, the June 17th three hours burn and the June 18th eight hours burn, all 17 hours of the 12-hour rolling average hours exceeded the 40 ppm CO emission limit. The overall average of the 12-hour rolling average CO values during those three burns was 84.8 ppm.
- During the June 23rd six hours long burn, the 12-hour rolling average hours were exceeded the first 4 hours of the burn. The overall average of the 12-hour rolling average CO values during the burn was 47.3 ppm.
- During the burn on June 24th there were no exceedances of the 12-hour rolling CO average. The average of the 12-hour rolling average during the burn was 37.3 ppm.

Over the 15 burns in the 1st report period the minimum value of the OOC 12-hour rolling average of CO @ 7% O₂ was 12.4 ppm and the maximum value was 184.1 ppm. The overall average of the 12-hour average CO concentrations during all of the burns, from the CEMS data, was 66.7 ppm.

There is a mixture of effects that result in exceedances of the 12-hour rolling average CO concentration. If the initial 1-hour average CO emission concentrations are followed by compliant 1-hour average CO concentrations from the OSWI unit (refer to the six burns on February 27th, April 21st & 22nd, June 17th, 18th & 23rd.burns) the likely cause is a brief high temperature trip of the afterburners or a lower temperature episode which allows a brief cooldown

followed by an automatic restart of the afterburner. During such an automated cool-down the 1-hour average CO emission concentration can increase then drop upon automatic restart of the afterburner. When a 1-hour average CO concentration deviation is followed by a compliant 1-hour average CO concentration level that causes an exceedance of the 12-hour or the 3-hour rolling average CO concentration limits, excessive rolling average CO concentration limit deviations cannot be readily avoided.

There were several 1-hour average CO concentration exceedances during eight of the burns, on January 22nd the CEMS suffered a malfunction that was being repaired during the burn, on February 27th the CEMS required recalibration, on April 21st a power surge shut down the afterburner and CEMS requiring a system reset, on April 22nd another power surge momentarily shut down the afterburner and CEMS resulting in a system reset and on May 7th the CEMS failed to calibrate and malfunction was repaired during the burn. On June 3rd the afterburner temperature dropped below 1,400°F periodically during the first few hours of the burn, on June 4th a blown fuse interrupted the CEMS operation (no data) and the afterburner temperature dropped to about 1,300 °F for about 20 minutes about 1.5 hours into the burn, on June 18th the afterburner temperature dropped below 1,400°F periodically during the first two hours of the burn resulting in elevated CO. In each of these cases the system was either quickly repaired or was able to automatically recover.

In reviewing the attached Rolling Average Emissions Report (see attached Table 2) it can be readily seen that several of the rolling 12-hour and 3-hour average CO emission level exceedances are triggered by early 1-hour average CO concentration exceedances. As discussed above, there were 33 recorded 1-hour average CO @ 7% O₂ emission concentration exceedances in the 15 burns over the report period that generated 67 12-hour and 49 3-hour rolling average exceedances/deviations.

Based upon 79.7 total hours of contraband incineration during 15 burns in the first half of 2020, the compliant amount of CO, @7%O₂, emitted during the report period is limited by air permit to

$$(1.29 \text{ lb/hour})(79.7 \text{ hours}) = 102.8 \text{ pounds CO @7\%O}_2.$$

The equivalent OOC CO mass emission of the 12-hour rolling average emission of CO @7% O₂, above the allowable, was:

$$(66.7 \text{ ppm} \div 40 \text{ ppm})(2.20 \text{ lb/hr})(79.7 \text{ hrs}) - (102.8 \text{ lb CO}) = \\ [(1.67)(2.20)(79.7) - (102.8)] = [(292.4) - (102.8)] = 189.6 \text{ lbs CO}$$

3-Hour Average CO @ 7% O₂ Deviations of the 40 ppm CO @7% O₂ Limit:

During the 1st OSWI unit burn, on January 22nd, the 3-hour rolling average CO concentration record shows five consecutive 3-hour rolling average CO concentration exceedances ending with the shutdown of the burn. The OSWI unit record indicates the afterburner tripped 3 or 4 times during the middle of the burn dropping the afterburner temperature below 1,000 °F accounting for a spike in the 1-

hour average CO emissions during the burn. Based upon the CEMS readings and the system being OOC an average of the 3-hour rolling average CO concentration was about 221.0 ppm. The 1-hour average CO OOC exceedances during the burn caused the rolling 3-hour average concentrations to stay elevated throughout the burn. The average of the rolling 3-hour average CO OOC concentrations during the burn was about 221.0 ppm.

During the 2nd burn on, February 27th, a deviation of the 3-hour rolling average CO concentration limit was triggered in the 2nd hour of the 8.1 hours long burn by a spike in the OOC CEMS reading of the 1-hour average CO concentration to 180.4 ppm. The next three hours of the burn the OOC CEMS 1-hour average CO concentration dropped below the emission limit. Even though the CEMS 1-hour average CO concentrations became compliant from the 5th hour through the end of the burn the rolling 3-hour average OOC CO concentrations remained in deviation for 4 hours from the 2nd hour through the 6th hour. The average of the 3-hour average OOC CO concentrations was about 68.1 ppm.

During the 3rd burn, on April 21st, a 4 hours long burn, there was an exceedance of the 1-hour average OOC CO concentration in all but the 2nd hour of the burn. Due to power surges causing afterburner trips the 1-hour average CO concentrations spiked. As a result, the OOC 3-hour average values for the burn averaged about 135.4 ppm, rolling 3-hour average.

Similarly, during the 4th burn of a 7 hours long burn, on April 22nd, there was an exceedance, recorded by the CEMS, of the 1-hour average OOC CO concentration of about 386.4 ppm in the 2nd hour of the burn. A power surge during the second hour of the burn caused an afterburner trip resulting in the 1-hour average CO concentrations spike. After resetting the afterburner and restarting, the last 5 hours were essentially in compliance with the 1-hour average CO concentration. However, the rolling 3-hour average OOC CO concentration exceeded the 40 ppm limit for the 1st, 2nd, 3rd and 4th hours of the burn. The OOC rolling 3-hour average values for the April 22nd burn averaged about 74.7 ppm CO.

The 5th and 6th burns (May 7th and 12th) were compliant with the OOC CEMS rolling 3-hour average CO concentration limit as were the OOC rolling 3-hour average CO estimations. The average OOC 3-hour rolling average CO concentration for the May 7th burn was 24.7 ppm and the average OOC 3-hour rolling average CO concentration for the May 12th burn was 25.6 ppm.

During the 7th burn, on May 26th, a 3.5 hours long burn, the CEMS read OOC exceedances of the 1-hour average CO concentration, during the last 2.5 hours of the burn resulting in an average of the 3-hours rolling average CO concentration during the burn of 67.9 ppm. The pen in the afterburner temperature recorder stopped working and was replaced but no circle chart record was generated; the system

software recorded temperatures at 10-minute intervals and demonstrated no low temperature conditions. The 1-hour and 3-hour rolling average CO exceedances were mostly due to the OOC condition.

The 8th burn, on May 27th, was compliant with the CEMS reading rolling 3-hour average CO concentration limit as were the OOC rolling 3-hour average CO estimations. The average of the OOC 3-hour rolling average CO concentration during the burn was 27.4 ppm.

During the 9th burn, on June 3rd, a 6 hours long burn, the 1-hr rolling average OOC CO concentrations exceeded the 40 ppm CO emission limit as did the 3-hour rolling average OOC CO concentration. The average of the OOC rolling 3-hour average CO concentration exceeded the 40 ppm limit until the last hour of the burn; the average during the burn was 123.9 ppm OOC CO.

During the 10th burn, on June 4, an approximately 3 hours long burn, the CEMS was not operational due to blown fuses. The CEMS was not restored to operation until the end of the burn so no CO and O₂ data was collected. Temperature data was collected and recorded. About one hour into the burn the afterburner temperature dropped to about 1,300 °F for less than 10 minutes and then resumed above 1,400 °F. for the remainder of the burn.

During the 11th burn, on June 16th, about a 6 hours long burn, there was an exceedance of the 1-hour average OOC CO concentration in the 3rd and 4th hours of the burn. The OOC 1-hour CO value was 228.9 ppm in the 3rd hour and 66.2 ppm in the 4th hour. The first 2 hours of the burn and the last few hours were compliant with both the 40 ppm OOC CO limit. The average of the rolling 3-hour average CO concentration was about 63.7 ppm CO.

During the 12th burn, on June 17th, a 3 hours long burn, there was an exceedance of the 1-hour average OOC CO concentration (129.8 ppm) in the 1st hour of the burn, followed by compliance with the 1-hour average CO concentration for the next 2 hours. The average of the 3-hour rolling average CO concentration limit during the burn was 71.3 ppm.

During the 13th burn, on June 18, an 8.5 hours long burn, there were exceedances of the CO emission limit in the 1st, 2nd and 3rd hours of the burn. This caused the CEMS 3-hour rolling average OOC CO concentration to exceed the 40 ppm CO limit during the first 4 hours of the burn (averaging about 91 ppm). The OOC values showed exceedance of the 1-hour average CO during the first 3 hours of the burn (averaging 145.1 ppm, 1-hour OOC average). The average of the OOC CO 3-hour rolling average CO emission concentration was about 69.6 ppm CO.

During the 14th burn, on June 23rd, there were two OOC CEMS recorded exceedance of the 1-hour averaging time CO emissions limit occurring during the first two hours of the burn. The afterburner temperature was recorded as dropping to just at 1,400 °F during the middle of the 1st and 2nd hours, which may have accounted for a slight elevation in the 1-hour averaging time increases to near the 40 ppm CO limit which was then elevated by being OOC to about 66 ppm, 1-hr average. As a result, there were exceedances of the OOC rolling 3-hour average CO concentrations during the 2nd through the 5th hours of the June 23 burn which caused the average of the 3-hour rolling average CO concentration to reach 42.1 ppm CO.

During the 15th burn, on June 24th, a 4 hours long burn, there were two OOC CEMS recorded 1-hour averaging time CO during the 2nd and 3rd hours of the burn that resulted in the 3-hour rolling average CO concentrations to exceed the 40 ppm CO emission limit. The average of the 3-hour rolling average CO concentration was 50.4 ppm CO. Most of the 3-hour rolling average CO emission concentration exceedances were the result of the OOC concentration adjustment to the CEMS records (note: none of the 3-hour rolling average values of the CEMS data were exceedances).

Over all hours of the 15 burns in the report period the minimum value of the OOC 3-hour rolling average value of CO @ 7% O₂ of 5.2 ppm and the maximum OOC value was a 3-hour rolling average concentration of 402.4 ppm. The overall average of the 3-hour rolling average OOC CO concentrations during all of the burns was 70.0 ppm.

Based upon 79.7 total hours of contraband incineration during 15 burns in the first half of 2020, the compliant amount of CO, @7%O₂, emitted during the report period is limited by air permit to

$$(1.29 \text{ lb/hour})(79.7 \text{ hours}) = 102.8 \text{ pounds CO @7\%O}_2.$$

The equivalent OOC CO mass emission of the 3-hour rolling average emission of CO @7% O₂, above the allowable, was:

$$(70 \text{ ppm} \div 40 \text{ ppm})(2.20 \text{ lb/hr})(79.7 \text{ hrs}) - (102.8 \text{ lb CO}) = \\ [(1.75)(2.20)(79.7) - (102.8)] = [(306.8) - (102.8)] = 204.0 \text{ lbs CO}$$

None of the above events resulted in a reportable quantity (RQ) of CO emissions (defined as 5,000 pounds for CO).

Second Semi-Annual Report Period – (07.01.2020-12.31.2020):

For the period July 1, 2020, through December 31, 2020, TIM conducted a total of 20 burns; the duration of all of those burns totaled 79.4 hours. The monthly distribution of hours of contraband burning during the 20 contraband burns from July 1 through December 31, 2020, was as follows:

Tucson hours per burn July-Dec 2020

July		August		September		October		November		December	
Day	Hours	Day	Hours	Day	Hours	Day	Hours	Day	Hours	Day	Hours
7	6.17	21	1.00	4	1.00	27	4.25	3	2.17	1	1.00
9	2.67	26	1.67	9	7.00			10	6.67	9	5.50
21	7.67			10	8.33			13	1.00	18	1.00
				16	3.33			17	6.67		
				23	3.30			24	6.50		
				25	2.50						

July-December Total Hours 79.40

Total Days 20

Deviations of CO Limitations:

It should be noted that the CO emission rate limit based upon the NSPS Subpart EEEE emission limitation of 40 ppm @7% oxygen, is approximately 1.29 lb CO/hour. Based upon 79.40 total hours of contraband incineration during the second half of the year, the compliant amount of CO, @7%O₂, emitted during the report period is limited to (1.29 lb/hour)(79.40 hours) = 102.43 pounds CO @7%O₂.

NSPS Subpart EEEE, section 60.2918 requires "The emission limitations and operating limits apply at all times except during OSWI unit startups, shutdowns, or malfunctions." TIM considers the first and last hours of each burn to be startup and shutdown periods. Those hours are not included in the Rolling Average Emissions Report (see attached Table 1 for the Annual Certification Report Period, Table 2 for the 1st Semi-Annual Report Period and Table 3 for the 2nd Semi-Annual Report Period), TIM is providing the following representations to convey the magnitude of the equivalent mass CO emissions limit exceedances during the report periods of concern. There were 15 burn days in the 1st semi-annual report period totaling 79.7 hours (all OOC) and 35.51 hours that were 'out of control' (OOC) out of the 79.4 burn hours in the 2nd semi-annual report period of 2020. The total OOC hours was (79.7 +35.51) = 115.2 hours OOC.

A new CO CEMS analyzer was installed on the contraband incinerator in December 2019 and the system passed a reasonable Accuracy Test Audit (RATA) on September 10, 2020. The following report covers the 2nd semi-annual period of 2020. The CEMS was considered OOC until it passed the RATA on September 10, 2020 (refer to the attached Table 3 - 2nd Report Period CO Emission Report w/OOC Record). Please note that the total burn hours during the 2nd semi-annual report

period was 79.4 hours but the CEMS was “on” recording for 69.73 of those hours primarily due to electrical breaks elsewhere in the system (the CEMS was not recording for 9.67 hours during those circuit failures).

1-Hour Average CO @7% O₂ Deviations of the 40 PPM CO @7% O₂ Limit:

For the 2nd semi-annual report period there were 20 burns with about 36 recorded 1-hour average carbon monoxide (CO) @7% O₂ emission concentration limit exceedances. Only the exceedances of the 1-hour averaging time CO, estimated mathematically, resulted in an average of the approximately 34 hours of exceedances of 392.3 ppm CO @7% O₂ taking into account the OOC operation prior to the September 10 RATA. For 9.67 individual hours of burn time during the report period (excluding startup and shutdown hours) the TIM CEMS did not collect CO or O₂ data due to electrical faults elsewhere in the system.

TIM suffered excessive CO data during the burns of July 7, 9 & 21, of August 26, of September 9, 10, 16 & 23, of October 27, of November 10, 17 & 24 and of December 9 (exceedances in 13 of the 20 burns). The number of CO exceedances spanned about 34 hours out of 79.4 hours of operation; the minimum 1-hour average CO concentration value was 0.1 ppm CO @7%O₂ and the maximum CO concentration value was 2,833.3 ppm CO @7% O₂ and all of the hours during the report period averaged 193.6 ppm CO @7% O₂. The CEMS was out of control (OOC) during the first 8 burns through September 10 then upon passing a RATA on September 10 the CEMS data became valid from the 9th through the 20th burn. The following is a summary of the 13 burns containing CO exceedances during the 2nd semi-annual report period:

<u>Burn Date</u>	<u>Burn Hours</u>	<u>(Number of) & Span of 1-Hr Exceedances</u>
07.07.2020	6.17 hours	(3) 1 st , 2 nd & 7 th hours
07.09.2020	2.67 hours	(3) 1 st , 2 nd & 3 rd hours
07.21.2020	7.67 hours	(6) 1 st thru 6 th hours
08.26.2020	1.67 hours	(2) 1 st & 2 nd hours
09.09.2020	7.0 hours	(3) 1 st , 2 nd & 3 rd hours
09.10.2020	8.33 hours	(1) 9 th hour
09.16.2020	3.33 hours	(3) 2 nd , 3 rd & 4 th hours
09.23.2020	3.3 hours	(3) 1 st , 2 nd & 3 rd hours
10.27.2020	4.25 hours	(3) 1 st , 2 nd & 3 rd hours
11.10.2020	6.67 hours	(3) 1 st , 2 nd & 3 rd hours
11.17.2020	6.67 hours	(1) 2 nd hour
11.24.2020	6.5 hours	(1) 1 st hour
<u>12.09.2020</u>	<u>5.5 hours</u>	(2) 1 st & 2 nd hours
13 burns	Σ=69.7 hr	Σ=34 hrs

The 1-hour averaging time CO emission limit is 40 ppm, equivalent to about 1.29 lb/hr. The recorded average of the CO, 1-hr average emission rate, based upon the 1-hour average CO @7% O₂ is 193.6 ppm (found on the attached Table 3) is:

$$(193.6 \text{ ppm}/40 \text{ ppm})(1.29 \text{ lb/hr}) = 6.24 \text{ lb/hr}$$

For the duration of all the burns: $(6.24 \text{ lb/hr})(79.4 \text{ hours}) = 495.5 \text{ lb CO}$

The CO emission allowable during the 2nd semi-annual period burns for the 79.4 hours duration of all the burns was $(1.29 \text{ lb/hr})(79.4 \text{ hr}) = 102.4 \text{ lb CO}$. Subtracting the CO allowable during the 79.4 hours from the estimated CO 1-hour average value of the exceedances results in an estimate of the excessive CO mass emission during the 2nd semi-annual report period of:

$$(495.5 - 102.4) \text{ lb CO} = 393.1 \text{ lb CO}.$$

The average of the excessive CO emissions only, during the 2nd semi-annual period burns, during approximately 34 hours duration of the 1-hr average exceedances was about 392.3 ppm. Mathematically, the equivalent mass emission rate is:

$$(392.3 \text{ ppm} / 40 \text{ ppm})(1.29 \text{ lb/hr})(34 \text{ hours}) = 430.2 \text{ lb CO}$$

Subtracting the CO allowable during the 34 hours from the estimated CO 1-hour average value of the exceedances results in an estimate of the excessive CO mass emission during the 2nd semi-annual report period of:

$$(430.2 - 102.4) \text{ lb CO} = 327.8 \text{ lb CO}$$

As noted above the CEMS was "on" recording for 69.73 of all 79.4 hours of the burns (refer to the top of page 12) primarily due to electrical interruptions elsewhere in the system. The following is a summary of the 7 burns with no data for CO or O₂ recorded by the CEMS during the 2nd semi-annual report period:

<u>Burn Date</u>	<u>Burn Hours</u>	<u>Issue Resulting in No Data from CEMS</u>
08.21.2020	1.0 hour	Afterburner interlock turned off accidentally
09.04.2020	1.0 hour	Dirty fan contact created intermittent cir break
09.25.2020	2.5 hours	Dirty fan contact created intermittent cir break
11.03.2020	2.2 hours	Afterburner outage caused low temp-cir break
11.13.2020	1.0 hour	Afterburner temperature $\approx 1,200^{\circ}\text{F}$, cir break
12.01.2020	1.0 hour	Afterburner temperature $\approx 1,200^{\circ}\text{F}$, cir break
12.18.2020	<u>1.0 hour</u>	Afterburner temperature $< 1,200^{\circ}\text{F}$, cir break
$\Sigma = 9.7 \text{ hours}$		

In each of these issues burners and electrical system repairs were made which returned the system to normal operation. The CEMS did not require repair in these instances, the problems were with electrical circuitry outside the CEMS, or as indicated, with the switching associated with afterburner operation that interrupted CEMS operation.

3-Hour Average CO:

Thirteen of the 20 burns during the 2nd semi-annual period experienced recorded exceedances of the 3-hour averaging time CO limit, from July 7 through December 9, 2020.

There were 7 burns (that totaled 9.7 hours of burn time) for which the CEMS did not record any data so it is not certain which of those burns may have exceeded the 3-hour CO rolling average. TIM's best guesstimate is that five burns, on August 21 (a 1 hour long burn), November 3 (a 2.2 hours burn) & 13 (a 1 hour burn) and December 1 (a 1 hour burn) & 18 (a 1 hour burn) may have been compliant and two burns, on September 4 (a 1 hour long burn) & 25 (a 2.5 hours burn) may have exceeded the 3-hour CO rolling average. Refer to the attached Table 3 – 2nd Rolling Avg CO Emissions Rates Report to affirm the last hours of the immediately previous hours of the above described 5 burns were compliant (compliant with the 1-hour rolling average and that the two burns estimated to be non-compliant were surrounded by non-compliant rolling averages from the prior and latter burns).

If this is reasonably correct, then there were 14 of the 20 burns during the 2nd semi-annual period that experienced exceedances of the 3-hour averaging time CO limit. The following is a summary of the 14 burns containing 3-hour CO rolling average exceedances during the 2nd semi-annual report period:

<u>Burn Date</u>	<u>Burn Hours</u>	<u>(Number of) & Span of 3-Hr Exceedances</u>
07.07.2020	6.17 hours	(4) 1 st , 2 nd , 3 rd & 4 th hours
07.09.2020	2.67 hours	(3) 1 st , 2 nd & 3 rd hours
07.21.2020	7.67 hours	(8) 1 st thru 8 th hours
08.26.2020	1.67 hours	(2) 1 st & 2 nd hours
09.04.2020	1.0 hour	(1) 1 st hour (a no data event)
09.09.2020	7.0 hours	(5) 1 st , 2 nd , 3 rd , 4 th & 5 th hours
09.16.2020	3.33 hours	(3) 1 st , 2 nd & 3 rd hours
09.23.2020	3.3 hours	(3) 1 st , 2 nd & 3 rd hours
09.25.2020	2.5 hours	(1) 1 st hours (a no data event)
10.27.2020	4.25 hours	(4) 1 st , 2 nd , 3 rd & 4 th hours
11.10.2020	6.67 hours	(6) 2 nd , 3 rd , 4 th & 5 th hours
11.17.2020	6.67 hours	(4) 3 rd , 4 th , 8 th , & 9 th hours
11.24.2020	6.5 hours	(3) 1 st , 2 nd & 3 rd hours
<u>12.09.2020</u>	<u>5.5 hours</u>	<u>(3) 1st, 2nd & 3rd hours</u>
14 burns	Σ= 64.9 hr	Σ=50 hrs

Together there were 50 hours of the 3-hour average CO limit exceedances. The average of only the 3-hour rolling average exceedances is 304.6 ppm. The mathematically equivalent mass emission of this average is:

$$(304.6 \text{ ppm} / 40 \text{ ppm})(1.29 \text{ lb/hr})(50 \text{ hours}) = 491.2 \text{ lb CO}$$

The CO emission allowable during the 2nd semi-annual period burns for the 50 hours duration of the 3-hr average exceedances is $(1.29 \text{ lb/hr})(50 \text{ hr}) = 64.5 \text{ lb CO}$. Subtracting the CO allowable during those 50 hours from the estimated CO 3-hour rolling average value exceedances results in a mathematical estimate of the excessive 3-hour average CO mass emission during the 2nd semi-annual report period of:

$$(491.2 - 64.5) \text{ lb CO} = 426.7 \text{ lb CO}.$$

The CO emission allowable during the 2nd semi-annual period burns for the 79.4 hours duration of all the burns was $(1.29 \text{ lb/hr})(79.4 \text{ hr}) = 102.4 \text{ lb CO}$. The average concentration of the 3-hour rolling average CO is 194.0 ppm (refer to attached Table 3). The mathematically equivalent mass emission, from all of the burns, to this average is:

$$(194.0 \text{ ppm} / 40 \text{ ppm})(1.29 \text{ lb/hr})(79.4 \text{ hours}) = 496.8 \text{ lb CO}$$

Subtracting the CO allowable covering the 79.4 burn hours from the estimated CO 3-hour average value of the exceedances results in an estimate of the excessive CO mass emission during the 2nd semi-annual report period of:

$$(496.8 - 102.4) \text{ lb CO} = 394.4 \text{ lb CO}.$$

12-Hour Average CO:

Twelve burns during the 2nd semi-annual period experienced exceedances of the 12-hour averaging time CO limit, from July 7 through December 9. Together there were 59 hours of the 12-hour average CO limit exceedances (excluding startup and shutdown hours). The average of the 12-hour rolling average for only the 59 hours of 12-hour average exceedances was 220.2 ppm CO. The CO allowable during those exceedances is $(1.29 \text{ lb CO/hour})(59 \text{ hours}) = 76.11 \text{ lb CO/hour}$. The mathematical estimate of the excessive 12-hour average CO mass emission is:

$$(220.2 \text{ ppm} / 40 \text{ ppm})(1.29 \text{ lb CO/hr}) = 5.5 \text{ lb CO/hour}$$

For the 59 hours of 12-hour average exceedances the mathematically equivalent mass emission rate is: $(5.5 \text{ lb CO/hour})(59 \text{ hours}) = 324.5 \text{ lb CO}$

The 12-hour rolling average CO exceedances results in a mathematical estimate of the excessive 12-hour average CO mass emission during the 2nd semi-annual report period of:

$$(324.5 - 76.11) \text{ lb CO} = 248.4 \text{ lb CO}.$$

The average of the CO concentrations listed in the 12-hour Rolling Average Emissions Report (see attached Table 3) is 174.5 ppm CO. The CO @7% O₂ emission limit is 40 ppm, equivalent to the 1.29 lb CO/hr emission rate. TIM estimates that the CO @7% O₂, 12-hr average, average hourly emission rate was:

$$(174.5 \text{ ppm}/40 \text{ ppm})(1.29 \text{ lb/hr}) = 5.63 \text{ lb CO/hr}$$

Estimated excess 12-hr average CO emissions during the 2nd semi-annual period for all of the burns was:

$$(5.63 - 1.29 \text{ lb/hr})(79.4 \text{ hr}) = (4.34 \text{ lb/hr})(79.4 \text{ hr}) = 344.4 \text{ lb CO}$$

None of the above events resulted in a reportable quantity (RQ) of CO emissions (defined as 5,000 pounds for CO).

Tally for the Year

There was a total of (15 burns + 20 burns) = 35 contraband burns during all of 2020 which resulted in 79.7 + 79.40 = 159.1 hours of burns duration for the year. The total CO emission allowable for all of 2020 is: (159.1 hours)(1.29 lb/hour) = 205.2 lb CO.

For all of 2020 there were (33 + 34) = 67 hours, out of 159.1 hours of contraband burns, that were out of compliance with the CO 1-hour average emission limit.

The average of the concentration of the CO exceedances during all of 2020 was 129.0 ppm (refer to the attached Table 1). An estimate of the CO, 1-hr average mass emission rate due to the exceedances total an average of:

$$(129.0 \text{ ppm}/40 \text{ ppm})(1.29 \text{ lb/hr}) = 4.16 \text{ lb CO/hour}$$

The excess CO 1-hour average CO emission for all of the burns in 2020 was:

$$(4.16 - 1.29 \text{ lb/hr})(159.1 \text{ hr}) = 456.6 \text{ lb CO}$$

above the permitted CO emission limitation

2020 Stack Test:

An annual stack performance testing conducted by Bison Engineering (Bison) on September 9 & 10, 2020, confirmed compliance with all air permit #127 emission limitations except dioxins/furans (D/F). Bison conducted additional stack testing for D/F on November 24, 2020. The test report for the November 24 test was prepared for submission to PDEQ December 22, 2020 but was revised for resubmission January 27, 2021. The test protocols for the performance stack testing and the RATA protocol for evaluation of the CO/O₂ CEMS previously authorized by PDEQ were acknowledged by PDEQ and used for the compliance stack testing.

In each stack test the total mass emission of D/F exceeded the 33 nanograms per dry standard cubic meter (ng/dscm) emission limit. NSPS Subpart EEEE has an OSWI unit emission limitation for D/F of 33 nanograms per dry standard cubic meter (ng/dscm) of exhaust. TIM's most recent estimation of the exhaust flow from the afterburner exit, without dilution air added in,

is 6,945.4 dscfm @7%O₂. On the basis of the afterburner exit exhaust flow rate and the NSPS EEEE and air permit #127 emission limit, the dioxin/furan emission rate limitation is:

$$(6,945.4 \text{ dscf/min})(60 \text{ min/hr})(33 \times 10^{-9} \text{ gram/m}^3)(\text{lb}/454 \text{ gm})(\text{m}^3/35.31 \text{ ft}^3) = 8.58 \text{ E-7 lb D/F/hr}$$

Applying the latest stack test result of 251 ng D/F/dscm the equivalent mass emission rate is:

$$(6,945.4 \text{ dscf/min})(60 \text{ min/hr})(251 \times 10^{-9} \text{ gram/m}^3)(\text{lb}/454 \text{ gm})(\text{m}^3/35.31 \text{ ft}^3) = 65.3 \text{ E-7 lb D/F/hr}$$

TIM is investigating ways to abate D/F emissions. TIM is researching additional sorbent or additives for injection into the exhaust stream to aid the abatement of D/F. Engineering solutions are being researched and operating issues are being evaluated.

Recordkeeping:

TIM kept records of operating limits, monitoring data and records of all operating considerations as required under the air permit and regulation requirements applicable to the facility. TIM contracts with Baker Enterprises to provide CEMS quarterly calibrations (CGA) and Bison Engineering, Inc. to provide CEMS reasonable accuracy test audits (Part 60 RATA) as well as stack testing. EPA Systems, LLC also assists with CGA and CEMS repair requirements on an 'as needed' basis. Calibration and 7-day calibrations records were maintained.

During the report period the primary incinerator chamber system has functioned normally as has the afterburner temperature monitor, gauges, and temperature recording system with exceptions as identified below. After the December 2019 new CO CEMS analyzer setup TIM completed CEMS system quarterly calibrations and reports during the 2020 report periods. During 2020 the new CO/O₂ CEMS analyzer, temperature monitors, afterburners and electrical systems operated with some intermittent problems, which were corrected according to the O&M plan. During the 2020 report period incinerator startup temperatures were maintained above 1400 °F before any contraband was fed into the unit and records maintained for each burn indicated process malfunctions occurred, as follows:

<u>Date</u>	<u>Temp / CO / CEMS Status</u>	<u>Resolution</u>
01.22.2020	Temp loss caused CO increase / CEMS	Afterburner / engineer repaired CEMS
02.27.2020	CO increase / CEMS inaccurate	CEMS out of calibration – engr corrected
04.21.2020	Afterburner trip-CO elevated / CEMS down	Power surge; power out 2.5 hrs; sys reset
04.22.2020	Afterburner trip-CO elevated / CEMS down	Power surge; power out 0.2 hr; sys restart
05.07.2020	CEMS not calibrating	Troubleshooting and repair by engineer
05.12.2020	CEMS malfunction inaccurate function	Troubleshooting/repair and recalibration
05.26.2020	Temperature chart failure	Replaced recording pen
06.03.2020	Afterburner temp drop / CO increase	Afterburner temperature & CO recovered
06.17.2020	Afterburner temp drop / CO increase	Afterburner temperature & CO recovered
06.16.2020	Circle temp chart recorder failure	Recorder repaired
	Afterburner temp drop / CO increase	Afterburner temperature & CO recovered
06.24.2020	Afterburner temp drop / CO increase	Afterburner temperature & CO recovered
07.21.2020	Afterburner temp drop to ≈1200°F/CO increase	Automatic afterburner restart

08.21.2020	Afterburner interlock turned off	Problem found and interlock turned back on
08.26.2020	Afterburner temp drop to $\approx 800^{\circ}\text{F}$ /CO increase	Automatic afterburner restart
09.04.2020	No data from CEMS	Dirty fan contact created intermittent cir break
09.16.2020	Afterburner 1 hr shutdown /CO increase	Electrical repair
09.23.2020	CEMS calibration failure	Engineer made repairs
09.25.2020	No data from CEMS	Dirty fan contact created intermittent cir break
10.27.2020	Afterburner damage, air leak, low temp	Mechanic made repairs
11.03.2020	No data from CEMS	Afterburner outage caused low temp-cir break
11.10.2020	One burner inoperative, low T /CO increase	Burner serviced for repair
	Blown fuse-air intake fan to afterburner	QO stopped feed & replaced blown fuse
11.13.2020	One burner inoperative, low T /CO increase	Burner serviced for repair
	No data from CEMS	Afterburner temperature $\approx 1,200^{\circ}\text{F}$, cir break
11.27.2020	Afterburner limited out	Restarted afterburner after about 20 min
12.01.2020	Afterburner emp drop in 1 st hour of burn	Afterburner restarted
	No data from CEMS	Afterburner temperature $\approx 1,200^{\circ}\text{F}$, cir break
12.18.2020	No data from CEMS	Afterburner temperature $\approx 1,200^{\circ}\text{F}$, cir break

The baghouse system and monitoring devices (pressure drop gauges) functioned normally during the reporting period, except for the incidents described below. There were no visible emissions from the exhaust stack during any of the contraband burns during the report period. Visual observations for opacity are made daily and recorded during the report period. Upset reports were provided to PDEQ for the 11/10/2020 process upset on 11/10 and 11/13/2020.

A summary of TIM records of the 2020 Annual Report Period maintenance was provided in the 2020 1st Semi-Annual Report to PDEQ. That record along with the maintenance for the 2nd report period follows:

<u>Date</u>	<u>Technician</u>	<u>Issue and Resolution</u>
- 01/13/2020	Mechanic Amlee	- installed a new electric motor on the small air compressor;
- 01/22/2020	Bruce Baker	- CEMS would not calibrate; flow rate from stack set too low; DAS premature start; repair at next burn;
- 01/23/2020	Bruce Baker	- Repaired startup protocol;
- 01/27/2020	Mechanic Amlee	- CEMS repair and reboot, repaired calibration system;
- 02/05/2020	Bruce Baker	- Teledyne power supply failure, ordered new components;
- 02/06/2020	Mechanic J. Arellano	- Shop vacuum to clean rust off stack fan;
- 02/11/2020	Mech Gerald Amlee	- Inspected baghouse for filter integrity;
- 02/17/2020	Mech Gerald Amlee	- Performed baghouse dye leak test; all tested ok;
- 02/24/2020	Bruce Baker	- Installed new components; corrected a short circuit; reassembled, re-spanned the gases and re-calibrated the CEMS;
- 03/25/2020	Bruce Baker	- DAS monitor problem; computer, monitor, analyzer & conditioner started normally; ran test gases;
- 05/07/2020	Bruce Baker	- Monitor failure & CEMS not calibrating; substitute monitor mis-matched to video card; was able to calibrate CEMS;
- 05/11/2020	Bruce Baker	- CEMS system out-of-date drives corrected and made a restore point; performed calibration; installed basic screen saver;
- 05/15/2020	Bruce Baker	- Worked with Dell to get computer motherboard repair;
- 05/19/2020	Bruce Baker	- Dell tech replaced motherboard; Mr. Baker reinstalled dataSoft and activated; checked data collection from analyzer;

- 05/27/2020 Bruce Baker - CEMS prematurely shutting down; probe heater malfunction causing dataSoft to go invalid; overrode probe heater alarm as temporary fix;
- 05/28/2020 Bruce Baker - Onsite to repair probe heater, corrected heater wiring, removed software jumper so CEMS could collect data; determined observed induction fan out-of-balance causing vibration;
- 06/03/2020 Mech Gerald Amlee - Inspected adsorbent injection system;
- 06/05/2020 Bestway Electric - Dynamically rebalanced induction blower fan;
- 06/11/2020 Welder - Cut open induction blower housing, removed loose material; completed blower motor repair;
- 06/00/2020 Bruce Baker - Repaired probe heater & reconnected to stack; repaired compressor controls;
- 06/00/2020 Gerald Amlee - Mechanic repaired large piston type air compressor;
- 06/00/2020 Mech Gerald Amlee - With welder Julio Perez made welding repairs on ductwork; adjusted reverse jet air pulse controls;
- 06/30/2020 Mech Gerald Amlee - Performed baghouse leak check, made plan for leak repairs.

- 07/03/2020 Baker Enterprises - Install battery in PLC, reprogram to run daily calibrations
- 07/04/2020 Baker Enterprises - Add program to PLC re zero gas between O₂ & CO; maintenance
- 07/06/2020 Linson Portable Weld - Sealed roof on cooling towers
- 07/12/2020 Baker Enterprises - Adjusted flow rate in probe and ran calibration
- 07/07/2020 Mechanic Amlee - Repair air bleed damper in baghouse
- 07/31/2020 Mechanic Amlee - Inspect small compressor
- 08/03/2020 Baker Enterprises - Reprogram PLC and HMI, tighten O₂ calibration
- 08/13/2020 Copperstate Nuts & Bolts- Nuts & bolts for furnace repair
- 08/17/2020 Mechanic Christie - Welded patches and furnace repairs (08/17, 08/27, 08/28)
- 08/18/2020 Merles - Replace furnace... silicone gasket
- Mechanic Christie - Sealed elbows on furnace (08/18 & 08/19)
- 08/19/2020 Baker Enterprises - Assist with restarting analyzer (08/19 & 08/20) & cycle all valves
- 08/21/2020 Linson Portable Weld - Welded patch on afterburner ductwork
- 08/21/2020 Mechanic Amlee - Work on small compressor and blower
- 08/21/2020 Baker Enterprises - Reset overload trip on furnace conveyor
- 08/25/2020 Sun Mechanical Inc - Fabricate 25 elbows & 25 Joints for furnace
- 08/27/2020 Mechanic Amlee - Repair afterburner cover
- 08/28/2020 J.T. Thorpe & Son - CF blankets for furnace
- 08/28/2020 Linson Portable Weld - Fabricate roof on afterburner
- 08/31/2020 Welder Perez - Furnace patching and repair
- 09/03/2020 Welder Perez - Furnace patching and repair, remove old tubing
- Mech Christie & Amlee- Check for system leaks and repair baghouse
- 09/08/2020 Baker Enterprises - Correct wiring, tighten gas valves, verify CEMS settings
- 09/09/2020 Baker Enterprises - Correct analyzer fault
- 11/10/2020 Dan Butwinski QO - Blown fuse stopped air intake fan of afterburner chamber
- 11/18/2020 Baker Enterprises - Assist w/restart of CEMS
- 12/09/2020 Mechanic Amlee - Conduct sorbent injection system quarterly inspection
- 12/23/2020 Baker Enterprises - System wiring repair

The baghouse system and pressure drop monitoring devices (Magnehelic pressure drop gauges) functioned normally during the reporting period; readings outside the allowed ranges of 3 to 8 in H₂O during the 2020 burns from the exhaust stack were recorded as follows:

<u>Date</u>	<u>Pressure Drop (in H₂O)</u>	<u>Resolution</u>
05.26.2020	2.4	no visible emissions
06.04.2020	2.2	no visible emissions
07.07.2020	2.4	no visible emissions
07.09.2020	2.6	no visible emissions
07.21.2020	2.5	no visible emissions
08.26.2020	1.4	no visible emissions
09.09.2020	2.3	no visible emissions
09.16.2020	2.5	no visible emissions
10.27.2020	2.8	no visible emissions
11.10.2020	2.7	no visible emissions
11.13.2020	2.3	no visible emissions
11.24.2020	2.5	no visible emissions
11.27.2020	2.9	no visible emissions
12.09.2020	2.5	no visible emissions
12.18.2020	2.2	no visible emissions

There were minor fluctuations with the temperature readings in the afterburner during the reporting period that were readily or automatically corrected and not resulting in a deviation from operating limits. The baghouse system and monitoring devices (pressure drop gauges) functioned normally during the reporting period.

There were no visible emissions from the exhaust stack during any of the contraband burns. Infrequently some smoke vents as an upset from the feed end of the primary chamber usually with opacity less than 10% but such smoke does not migrate beyond the TIM property line. Contraband bales fed into the primary chamber can sometimes disrupt the exhaust flow toward the afterburner chamber (negative pressure provided by baghouse induction fan) resulting in momentary exhaust flow diversions.

Reference Method 9 - Record of Visual Determinations of Opacity were completed by EnviroSure, LLC during 2020 and recorded on July 7, 2020, September 9, 2020 and November 17, 2020.

The OSWI operator has maintained the OSWI unit compliance by assuring the afterburner chamber temperature is above 1400 °F before contraband feed starts, monitoring baghouse cleaning cycles during contraband burns, monitoring CEMS operation requirements and by maintaining the sorbent injection system. The main operating parameters that were balanced to achieve compliance during 2020 were: (1) maintaining afterburner chamber temperature, (2) optimization of contraband feed rates, (3) adjusting primary chamber rotation, and (4) adjusting the secondary chamber exhaust gas cooling system to assure protection of the baghouse components. Issues with the baghouse operation, the CEMS operation, observing for visible

emissions, or monitoring for primary or secondary chamber issues during the Annual Report period of 2020, were as follows:

Occasional upset smoke emissions due to backwashed exhaust from the primary chamber tube opening is not a point source emission nor is it a normal process emission. The only point source of visible emissions (that is particulate matter emission) that is regulated by NSPS EEEE and TIM's PDEQ air permit #127 is that from the baghouse exhaust stack (EPN 1). During normal operation there is no emission to the atmosphere from the primary chamber tube inlet because normally air is swept into the unit through the tube opening to supply combustion air in the primary chamber. When the system malfunctions the exhaust flow rate was interrupted enough in the primary chamber to cause combustion products in the primary chamber to backwash, flowing out the tube opening. TIM reported such events as upset conditions.

A helper has been provided to the qualified operator to assist during contraband burns. The helper function is to keep sorbent supplied to the sorbent injection system and stays in communication with the qualified operator regarding sorbent system status during each burn.

TIM provides PDEQ with assessment of malfunctions with the best understanding of the system problems at the time of an event. A follow-on excess emission report is filed with PDEQ to more accurately identify issues and resolution of the malfunction.

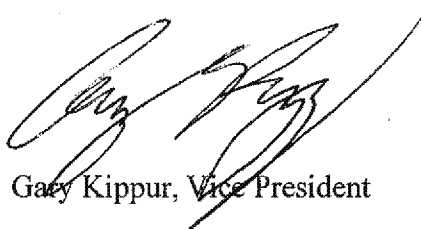
TIM has maintained compliance with all special conditions of operating permit #127 during the report period. TIM strived: to maintain compliance with NSPS Subparts A and EEEE; to meet CO exhaust concentrations limits during burns; to meet fuel requirements for startup; to maintain visual monitoring for opacity; to assure startup and shutdown procedures were followed; to have proper sampling port and platforms placement for stack testing; and secured EPA Region 9 approval of TIM's Petition for Operating Limits for the sorbent injection system (which was approved September 27, 2016). Stack test protocols are filed with PDEQ and EPA Region 9 and TIM anticipates the next required stack test and RATA test will be scheduled in early 2021. CEMS requirements and recordkeeping and reporting requirements are currently met.

The CO and O₂ CEMS provided continuous measurements during contraband burns during the report period except for the above-described outages which are corrected and the D/F issue which is being investigated. The facility's qualified operator is trained on the CEMS calibration and operating procedures. During all of the burns there were no visible emissions from the exhaust stack throughout the reporting period. The only visible emissions were upset visible emissions from the primary chamber feed tube and combustion air inlet opening described above. No contraband was fed into the unit when the afterburner chamber temperature readings were below 1400 °F during startups, shutdowns or upset conditions.

I am the Responsible Official (R.O.) for Tucson Iron & Metal and for the purpose of annual certification, pursuant to Title V requirements, I certify that this compliance certification and deviation report, based on information and belief, to the best of my knowledge formed after reasonable inquiry, during the time period from January 1, 2020, through December 31, 2020, is true, accurate, and complete.

If you have any questions or require additional information, please contact me at 520-884-1554.

Sincerely,



Gary Kippur, Vice President

Enclosures: Attachment #1 - Supporting Documentation – Pollutant Emission Rates
Tables 1, 2 and 3 –Rolling Average CO Emission Rates Record

cc: Mr. Matt Salazar, Manager
Enforcement ENF-2-1
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Attachment #1: Supporting Documentation:
Pollutant Emission Rates from Combustion of Solid Fuel Contraband Waste in OSWI Unit

A conservative estimate of the stoichiometric exhaust flow rate from an incinerator combustion chamber can be based upon 1 ft³ of air consumed in combustion for each 100 Btu of heat released. This is equivalent to applying 10 ft³ of air, the stoichiometric amount of air, required to burn 1 ft³ of natural gas fuel with a heating value of 1,000 Btu/ft³ (North American Combustion Handbook, p 18). This value has to be converted to a determination of products of complete combustion for solid fuels in the primary chamber. According to the North American Combustion Handbook (pp 51-52) for a solid fuel, a formula for determining the dry flue gas volume per pound of fuel (ft³ dcp/lb fuel), assuming negligible amounts of combined nitrogen and sulfur, is approximately:

$$\text{ft}^3 \text{ dcp/lb fuel} = (\%C \times 1.508) + (\%H \times 3.553) + (\%S \times 0.566) + (\%N \times 0.135) + (\%XSA/100) \cdot [(\%C \times 1.508) + (\%H \times 4.493) + (\%S \times 0.565)]$$

The contraband waste marijuana is mostly like cellulose, an organic compound with the formula (C₆H₁₀O₅)_n which has a molecular weight of approximately 190. In this case cellulose is 50.51%_{wt} carbon, 7.37%_{wt} hydrogen and 42.11%_{wt} oxygen (combined). The illegal drugs are usually coated with automotive grease which contains sulfur (S) (approximately 80%C, 10%H, 10%S) as an aid to resist detection.

The design feed rate of hard narcotics represent (30÷2030)(100%) = 1.48% of the contraband. The chemical formula for cocaine is C₁₇H₂₂O₄NCl (m.w. = 339.5), which indicates cocaine is 60.1%C, 6.5%H, and ≈10%N. The chemical formula for heroin is C₂₁H₂₃NO₅HCl (m.w. = 405.5) which indicates that heroin is 62%C, 6%H and ≈10%N. TIM assumes an average mix of 50/50 cocaine and heroin will be burned in the contraband incinerator resulting in 61%C, 6.2%H and ≈10%N. The limit of hard narcotics to be incinerated is 1.48% of the contraband waste.

Automotive grease density is about 93 lb/ft³ with about 5% sulfur content. For a bail or package of contraband, averaging about 35 lb/box, the contraband, including about 10% grease, results in contraband having about 3.5 lb grease; at about 5% sulfur this equates to about 0.18 lb S per bail or package. At 2,030 lb contraband/hour feed rate (58 packages contraband/hour)(3.5 lb/pkg) ≈ 203 lb grease/hour covering all the illegal drugs. The sulfur content is about (58 pkg/hour)(0.18 lb S/pkg) = 10.44 lb S/hr (upon combustion this is equivalent to about 20.88 lb SO₂ which is reduced in the exhaust by sorbent injection in the afterburner exhaust duct). All of the constituents are considered by law enforcement to be contraband.

Assuming the chemical structure for automotive grease is generally C_nH_{2n} with thickeners and sulfur compounds added. If the organic constituent of the above grease chemistry is a C₁₂ compound, with the hydrogen at H₂₄, the molecular weight of the grease is about 168. If of the 2,000 lb marijuana/hour feed limit is about 10% grease then marijuana is about 1,800 lb/hour of the contraband (88.67%). Of the 30 lb/hr hard narcotics 10% is grease then about 27 lb/hour is hard narcotics. Grease is 203 lb/hour of the contraband. The carbon species in the grease-based organic oils is (144/168)(100%) = 85.71%C and the hydrogen content is (24/168)(100%) = 14.29%H. Fillers such as clay (resulting in particulate upon incineration) and sulfur (resulting in SO₂ upon incineration) are added to the grease formulation; only sulfur is considered significant.

The scaled atomic carbon species of marijuana and grease is [(100%)[(0.5051 C)(0.90 factor) + (0.8572 C)(0.10 factor)] = (100%)(0.4546 + 0.08572) = 54.03% C. The scaled atomic hydrogen

species of marijuana and grease is $(100\%)[(0.0737 \text{ H})(0.90 \text{ factor}) + (0.1429 \text{ H})(0.10 \text{ factor})] = (100\%)(0.06633 + 0.0143) = 8.063\%_{\text{wtH}}$. The sulfur content is $(100\%)[(0.05 \text{ S})(0.10 \text{ factor})] = 0.50\%_{\text{wtS}}$. Similarly the nitrogen content, coming from narcotics/stimulants is $(100\%)[(0.10 \text{ N})(0.0148 \text{ factor})] = 0.15\% \text{ N}$.

$$\begin{aligned}\text{ft}^3 \text{ dcp/lb fuel} &= (\%C \times 1.508) + (\%H \times 3.553) + (\%S \times 0.566) + (\%N \times 0.135) + (\%XSA/100) \cdot [(\%C \times 1.508) + (\%H \times 4.493) + (\%S \times 0.565)] \\ &= (54.03)(1.508) + (8.063)(3.553) + (0.50)(0.566) + (0.15)(0.135) + (0.45)[(54.03)(1.508) + (8.06)(4.493) + (0.50)(0.565)] \\ &= 81.48 + 28.65 + 0.28 + 0.02 + 0.45(81.48 + 36.22 + 0.28) \\ &= 110.43 + 0.45(117.98) \\ &= 110.43 + 53.09 \\ &= 163.52\end{aligned}$$

Combustion of Plastic Wrap as Fuel in OSWI Unit

The incineration of plastic wrapping materials that are associated with contraband to be disposed includes plastic wrapping materials, such as polyvinyl chloride (PVC) [a polymer of vinyl chloride, $(\text{CH}_2=\text{CHCl})$, m.w. = 62.5], also found in vinyl-backed tapes, duct tape or electrical tape, and polyvinylidene chloride (PVDC) [a polymer of 1,1-dichloroethylene, $(\text{C}_2\text{H}_2\text{Cl}_2)$, m.w. = 96.95], which is clear stretch-wrap packaging such as Saran® Wrap. Plastic wrapping materials that are made of polyethylene, polypropylene or polystyrene (polyolefins) are also used [polymers of C_2H_2 , C_3H_6 and C_6H_6 average m.w. ≈ 56 ($\approx \text{C}_4\text{H}_8$ which is about 85% C and 15% H)].

PVDC is polymerized from a mixture of about 15% vinyl chloride and about 85% vinylidene chloride. Upon incineration these materials will lead to products of combustion. TIM estimates that a formulation of plastic film used to wrap contraband may contain about 50% PVC or PVDC polymers. The average molecular weight of plastic wrapping materials, assuming generally equal usage of various plastics, for calculational purposes, results in an overall average m.w. ≈ 70 ($\approx \text{C}_3\text{H}_6$ which is about 85% C and 15% H).

The amount of plastic wrap to be processed in the TIM OSWI unit should not exceed about 4.0%_{wt} plastic wrap. To feed 2,030 lb/hr into the OSWI unit in packages containing about 35 pounds each requires $(2,030 \div 35) \approx 58$ boxes. Each box is estimated to contain about 1.4 pounds of plastic which is equivalent to about $(58 \text{ boxes/hr})(1.4 \text{ lb plastic}) \approx 81 \text{ lb plastic/hr}$ $(100\%)(81/2,030) = 4\%$.

For plastic wrap which burn as a fuel, a formula for determining the dry flue gas volume per pound of fuel ($\text{ft}^3 \text{ dcp/lb fuel}$, at 7% oxygen (roughly 45% excess air) is:

$$\begin{aligned}\text{ft}^3 \text{ dcp/lb fuel} &= (\%C \times 1.508) + (\%H \times 3.553) + (45/100) \cdot [(\%C \times 1.508) + (\%H \times 4.493)] \\ &= (85.0 \times 1.508) + (15.0 \times 3.533) + (0.45)[85 \times 1.508 + (15.0 \times 4.493)] \\ &= 128.18 + 53.00 + 0.45(128.18 + 67.40) \\ &= 181.18 + 88.01 \\ &= 269.19\end{aligned}$$

Exhaust Flow Rate from Combustion of Natural Gas Fuel in OSWI Unit

Natural gas fired in the afterburner is an organic compound with the formula (CH_4) which has a molecular weight of 16. In this case natural gas is 75%_{wt} carbon, 25%_{wt} hydrogen (combined). The firing of gas in the afterburners is 6.0 MM Btu/hour and the density of natural gas is 0.0438 pounds per ft^3 (lb/ft^3). At a heat content of 1,000 Btu/ ft^3 the gas firing rate is 6,000 ft^3/hour and at the above

density the natural gas feed rate is $(6,000 \text{ ft}^3/\text{hour})(0.042 \text{ lb}/\text{ft}^3) = 252 \text{ lb}/\text{hour}$. Natural gas is about 75% carbon and about 25% hydrogen. For the natural gas fuel, a formula for determining the dry flue gas volume per pound of fuel ($\text{ft}^3 \text{ dcp}/\text{lb fuel}$, at 7% oxygen (roughly 45% excess air) is:

$$\begin{aligned}\text{ft}^3 \text{ dcp}/\text{lb fuel} &= (\%C \times 1.508) + (\%H \times 3.553) + (45/100) \cdot [(\%C \times 1.508) + (\%H \times 4.493)] \\ &= (75.0 \times 1.508) + (25.0 \times 3.553) + (0.45)[75 \times 1.508 + (25.0 \times 4.493)] \\ &= 113.1 + 88.32 + 0.45(113.1 + 112.32) \\ &= 113.1 + 88.33 + 101.44 \\ &= 302.87\end{aligned}$$

OSWI Unit Exhaust Flow Rate prior to Introduction of Cooling Air

The volume of combustion products, standard conditions and dry basis, for burning solid fuel contraband waste is about 170 ft^3 per lb fuel. Adjustment has to be made to 7% excess oxygen at the incinerator exit (refer to the NSPS Subpart EEEE limitations). For 2,030 lb solid waste fuel/hour the total standard cubic feet per minute (scfm) of exhaust at 7% oxygen exiting the primary chamber and entering the afterburner chamber will be: $(2,030 - 80 \text{ lb contraband}/\text{hour})(163.52 \text{ ft}^3/\text{lb contraband fuel})(\text{hour}/60 \text{ min}) + (80 \text{ lb plastic}/\text{hour})(269.2 \text{ ft}^3/\text{lb contraband fuel})(\text{hour}/60 \text{ min}) = (5,314.4 + 358.9) \text{ scfm} = 5,673.3 \text{ scfm}$

The afterburner chamber exhaust only from the firing of natural gas fuel is $(252 \text{ lb nat gas})(302.87 \text{ ft}^3/\text{lb gas})(\text{hour}/60 \text{ min}) = 1,272.05 \text{ scfm}$

The total of the exhaust flows from the primary chamber combined with the exhaust flow from the natural gas firing in the afterburner chamber is $(5,673.3 + 1,272.05) \text{ scfm} = 6,945.35 \text{ scfm}$

Total Combustion Products Flow at the Afterburner Exit into the Exhaust Duct:

The estimated design maximum total exhaust flow from the OSWI unit, calculated at standard conditions, dry basis, 7% oxygen, is the sum of the above-calculated flows, as follows:

$$(5,673.35 \text{ dscfm @ } 7\% \text{ O}_2) + (1,272.05 \text{ dscfm @ } 7\% \text{ O}_2) = 6,945.4 \text{ dscfm @ } 7\% \text{ O}_2$$

TIM has determined that the operating parameters for the incinerator will vary with feed loaded into the incinerator. Gas firing is maintained in the afterburner chamber to assure an operating temperature of at least $1,400^\circ\text{F}$. At $8,000 \text{ Btu}/\text{lb contraband}$, the heat release in the primary chamber is about:

$$(2,030 \text{ lb contraband}/\text{hour})(8,000 \text{ Btu}/\text{lb contraband fuel}) = 16,240,000 \text{ Btu}/\text{hour}$$

or $16.24 \text{ MMBtu}/\text{hour}$.

The heat requirement, using burners without a separate source of combustion air in the afterburner, is $2,000 \text{ Btu}/\text{hour}$ per scfm of exhaust to heat the processed stream to $1,400^\circ\text{F}$ (Eclipse, Inc. Engineering Guide, p 45). Since the exhaust flow from the primary chamber into the afterburner chamber is $5,645.35 \text{ scfm}$, the required heat to maintain $1,400^\circ\text{F}$ is:

$$(2,000 \text{ Btuhr}/\text{scfm})(5,645.35 \text{ scfm}) = 11,290,700 \text{ Btu}/\text{hour}$$

or approximately 11.291 MMBtu/hour plus heat loss to the environment. Since the available heat from the design maximum contraband feed rate is about 16.24 MMBtu/hour, once the unit is up to the minimum required operating temperature the heat release from the contraband feed should be able to sustain the required afterburner chamber temperature.

This calculation indicates that since the afterburners are rated at 6.0 MMBtu/hour the afterburners alone may not be able to sustain the temperature during very low load conditions [below 3.0 MMBtu/hour from the contraband, i.e. feed rates below about 375 to 400 lb/hour (3.0 MMBtu/hr difference \div 8,000 Btu/lb)]. The OSWI unit has to have the heat release contribution from the operation of the primary chamber to sustain the required operating temperature in the afterburner chamber. This should not be considered an absolute operating parameter because experience has shown that as the burn progresses the afterburner chamber temperature rises considerably above the 1,400 °F minimum.

Emission Factors

The tables found in the U.S. EPA AP-42 emission factors for wood residue combustion, from Tables 1.6-1, -2 and -3, (assumed to be the same for contraband vegetative waste combustion) and the emission factors for natural gas fuel combustion, for heat input between 0.3 and 10 million Btu/hour, from Table 1.4-1 and -2 were used in making the evaluation of the process emissions:

AP-42 Emission Factors for Wood Residue (Contraband) Combustion

Pollutant	Waste Emission Factor (lb/MMBtu)
PM ₁₀ *	0.50
PM _{2.5}	0.43
SO ₂	0.025
NO _x	0.22
CO	0.60
TOC (VOC)	0.039

* All PM emissions are controlled by the fabric filter system.

AP-42 Emission Factors for Natural Gas Fuel Combustion

Pollutant	Fuel Emission Factor (lb/MMBtu)
PM ₁₀	0.0075
PM _{2.5}	0.0075
SO ₂	0.0006
NO _x	0.0980
CO	0.0824
TOC (VOC)	0.0054

Carbon Monoxide (CO) Emission Limitation Calculations

The maximum CO emission rate based upon the NSPS Subpart EEEE limitation of 40 ppm @7% oxygen, 3-hour average is:

$$(6,945.4 \text{ dscf/min@7\%O}_2)(60 \text{ min/hour})(40 \text{ ft}^3 \text{ CO}/10^6 \text{ ft}^3 \text{ exhaust}) = 16.67 \text{ ft}^3 \text{ CO} / \text{hr}$$

$$(16.67 \text{ ft}^3 \text{ CO} / \text{hr})(\text{lb-mole}/359 \text{ ft}^3)(28 \text{ lb/lb-mole}) = 1.30 \text{ lb CO/hour, 3-hr avg}$$

One of the main purposes of the incinerator afterburner is to control CO emissions to within the 40 ppmv (dry basis, standard conditions, 7% O₂) limitation. This mass emission rate reflects the air permit CO emissions calculated from the NSPS Subpart EEEE limitation.

Particulate Matter (PM) Emission and Limitation Calculation

The NSPS Subpart EEEE and permit #127 have a limitation of 0.013 gr/dscf. The exhaust flow from the incinerator at the afterburner exhaust will be 6,917.4 dscf/min @7% O₂. On the basis of a maximum concentration of 0.013 gr PM/dscf, the uncontrolled emission rate should not exceed:

$$(6,945.4 \text{ dscf/min@7\%O}_2)(0.013 \text{ gr/dscf})(1.0 \text{ lb}/7,000 \text{ gr})(60 \text{ min/hr}) = 0.774 \text{ lb PM}_{10} / \text{hour}$$

The TIM baghouse efficiency is greater than 90% and anticipates compliance with the NSPS Subpart EEEE PM emission limitation.

Sulfur Dioxide (SO₂) Emission Calculation

The maximum SO₂ emission rate from the EPA AP-42 emission factors for contraband vegetative waste incineration without including fuel firing of natural gas in the afterburner and at least 90% control efficiency due to adsorbent injection is:

$$(16.24 \text{ MMBtu/hr})(0.025 \text{ lb SO}_2/\text{MMBtu})(1.00 - 0.90) = 0.041 \text{ lb SO}_2/\text{hr}$$

The NSPS Subpart EEEE limits SO₂ emissions to 3.1 ppmv, 3-run average (1 hour minimum sample time per run). On this basis the average SO₂ emission rate limitation, assuming a molecular weight of 64 lb/lb-mole, should be:

$$(6,945.4 \text{ dscf/min@7\%O}_2)(60 \text{ min/hr})(3.1 \text{ ft}^3 \text{ SO}_2/10^6 \text{ ft}^3) = 1.29 \text{ ft}^3 \text{ SO}_2 / \text{hour}$$

$$(1.29 \text{ ft}^3 \text{ SO}_2 / \text{hr})(\text{lb-mole}/359 \text{ ft}^3)(64 \text{ lb/lb-mole}) = 0.23 \text{ lb SO}_2 / \text{hour}$$

The TIM sorbent injection system is designed to control emissions to within the NSPS Subpart EEEE SO₂ emission limitation of 3.1 parts per million (ppm). The NSPS concentration limit results in a maximum allowable SO₂ mass emission rate of 0.23 lb/hour, as calculated above.

Nitrogen Oxides (NO_x) Emission Calculations

The maximum NO_x emission rate for contraband vegetative waste incineration without natural gas fuel firing in the afterburner (recall that 15.76 MMBtu/hour plus heat loss to the environment is required to maintain 1,400 deg F in the afterburner chamber) based upon NSPS Subpart EEEE limits (103 ppm, 3-run avg) (assuming an average molecular weight for NO_x of 33.4 lb/lb-mole) is:

$$(6,945.4 \text{ dscf/min@7\%O}_2)(60 \text{ min/hr})(103 \text{ ft}^3 \text{ NO}_x/10^6 \text{ ft}^3) = 42.92 \text{ ft}^3 \text{ NO}_x / \text{hour}$$

$$(42.92 \text{ ft}^3 \text{ NO}_x / \text{hr})(\text{lb-mole}/359 \text{ ft}^3)(33.4 \text{ lb/lb-mole}) = 3.993 \text{ lb NO}_x / \text{hour}$$

The afterburner chamber fires intermittently, dependent upon lower than design feed of contraband into the unit, so NO_x emissions will normally be less than the design rate calculated above and TIM requests the air permit NO_x emissions limit be based upon the value calculated from the NSPS Subpart EEEE limitation.

Hydrogen Chloride (HCl) Emission Limitation Calculation

NSPS Subpart EEEE specifies an HCl emission limitation of 15 ppm_d, 3-run average (1 hour minimum sample time per run). On this basis, the average HCl emission limitation should be:

$$(6,945.4 \text{ dscf/min@7\%O}_2)(60 \text{ min/hour})(15 \text{ ft}^3 \text{ HCl}/10^6 \text{ ft}^3 \text{ exhaust}) = 6.285 \text{ ft}^3 \text{ HCl} / \text{hr}$$

$$(6.285 \text{ ft}^3 \text{ HCl} / \text{hr})(\text{lb-mole}/359 \text{ ft}^3)(36.5 \text{ lb/lb-mole}) = 0.64 \text{ lb HCl/hour}$$

TIM has proposed the installation of a sorbent injection system which, in addition to control of SO₂ emissions, will also control HCl emissions to within the NSPS Subpart EEEE emissions limitation.

Heavy Metals Emission Limitation Calculations

NSPS Subpart EEEE contains emission limitations for three heavy metals, cadmium (Cd), lead (Pb) and mercury (Hg). The limitations are:

Heavy Metal Pollutant	Emission Limitation*
Cadmium	18 µg/dsm ³
Lead	226 µg/dsm ³
Mercury	74 µg/dsm ³

* micrograms per dry standard cubic meter (µg/dsm³)

The OSWI incinerator unit emission limitation for these heavy metals, on the basis of 5,629.9 dscf/min@7%O₂ exhaust flow rate at the afterburner exit, before dilution air is introduced, should be:

$$(6,945.4 \text{ std ft}^3/\text{min})(60 \text{ min/hr})(18 \times 10^{-6} \text{ gm Cd}/\text{m}^3)(\text{lb}/454 \text{ gm})(\text{m}^3/35.31 \text{ ft}^3) = 0.000468 \text{ lb Cd/hr}$$

$$(6,945.4 \text{ std ft}^3/\text{min})(60 \text{ min/hr})(226 \times 10^{-6} \text{ gm Pb}/\text{m}^3)(\text{lb}/454 \text{ gm})(\text{m}^3/35.31 \text{ ft}^3) = 0.00587 \text{ lb Pb/hr}$$

$$(6,945.4 \text{ std ft}^3/\text{min})(60 \text{ min/hr})(74 \times 10^{-6} \text{ gm Hg}/\text{m}^3)(\text{lb}/454 \text{ gm})(\text{m}^3/35.31 \text{ ft}^3) = 0.00192 \text{ lb Hg/hr}$$

TIM proposes the air permit heavy metals emission rate allowables be based upon the above-calculated NSPS Subpart EEEE limit.

Volatile Organic Compound (VOC) Emission Limitation Calculation

The VOC emission rate from the EPA AP-42 emission factors for contraband vegetative waste incineration without fuel firing of natural gas in the afterburner is:

$$(16.24 \text{ MMBtu/hr})(0.039 \text{ lb VOC/MMBtu}) = 0.63 \text{ lb VOC/hr}$$

There is no VOC emission limitation in NSPS Subpart EEEE.

Dioxins / Furans (D/F) Emission Limitation Calculation

NSPS Subpart EEEE has an OSWI unit emission limitation for dioxins/furans, which are particular VOC chemical species, of 33 nanograms per dry standard cubic meter (ng/dscm) of exhaust. On the basis of 6,917.4 dscfm@7%O₂ exhaust flow rate and the NSPS limit, the dioxin/furan emission rate limitation is:

$$(6,945.4 \text{ dscf/min@7\%O}_2)(60 \text{ min/hr})(33 \times 10^{-9} \text{ gram/m}^3)(\text{lb}/454 \text{ gm})(\text{m}^3/35.31 \text{ ft}^3) = 8.58 \text{ E-7 lb dioxin-furan/hr}$$

TIM proposes the dioxin/furan emission rate from the OSWI incinerator unit, be based upon the NSPS Subpart EEEE limitation and the chosen exhaust flow rate.

Emissions Summary Table

The following table summarizes the instantaneous and annual emission rates of the products of combustion from the operation of the OSWI unit. The estimated maximum proposed operating schedule for the incinerator will be 12 hours/day, 5 days/week, 52 weeks/year (3,120 hr/yr).

**Summary of Incinerator Normal Operation Emissions Limitations
Without Startup and Shutdown Emissions Included**

Pollutant	lb/hr	tons/year*
PM ₁₀	0.77	1.20
Cadmium	0.000468 lb Cd	0.00061
Lead	0.00587 lb Pb	0.00763
Mercury	0.00192 lb Hg	0.0025
SO ₂	0.23	0.36
NO _x	3.99	6.10
CO	1.29	2.01
TOC (VOC)	0.67	1.05
HCl	0.64	0.98
D/F	8.57 E-7	11.14 E-7

* based upon 3,120 hours/year contraband incineration during normal operation (allowing additional 520 hours/year for start-up using only start-up fuel and shut-down by cessation of feed).

Incinerator Operating Procedures - Incinerator Cold-Start:

Cold start of the incinerator requires firing the afterburner chamber followed by using starter fuel (paper, cardboard and/or wood) inside the primary chamber, as needed, without incinerator rotation. The marijuana and the narcotics contraband are both very combustible and once the afterburner is up to operating temperature (at least 1,400 °F), contraband is fed onto the conveyer belt into the starter fire and ignites. Once the vegetative contraband is burning the primary combustion chamber rotation is initiated to feed the contraband material into the OSWI unit. The thick refractory lining of the rotary chamber maintains the desired operating temperature while the kiln continually processes the burning material with air drawn through the front opening of the combustion chamber supporting the combustion. The rotary incinerator system reaches normal operating temperature within less than one hour of the initial start-up of the unit and an entire burn, typically ranging from 3 to 10 hours continues until the contraband feed stops.

As a result of the kiln chamber rotation the non-combustibles, primarily ash, drop into an exterior ash receptacle below the unit. Any smoke leaving the incinerator combustion chamber will be drawn into the baghouse abatement system for final emissions control.

A thermocouple located in the secondary combustion chamber (the afterburner) where the incinerator vents into the exhaust duct is used to sense temperatures and to provide control panel indications for maintenance of incinerator operating temperature. Indicators on the control panel confirm when proper operating temperatures are reached and feed rates can be adjusted to assure compliant incinerator operation. The thermocouple mounted in the afterburner chamber senses the temperature of the exhaust gases just as they leave the incinerator. In the past TIM has tried placing thermocouples inside the incineration chambers but they quickly fail because of extremely high temperatures.

The contraband is ignited by the startup fire in the stationary firebox; once the contraband is flaming, a slow rotation of the combustion chamber is followed by feeding additional contraband waste into the unit at a rate not to exceed 2,000 lb/hour (but limited to the feed rate during the most recent stack test). As the fire increases the contraband feed rate and the rotation of the unit are optimized.

Air contaminant emissions from the process consist of products of combustion including particulate matter (PM), volatile organic compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO) and sulfur dioxide (SO₂). TIM has estimated that at low-load conditions during cold-start operation, the CO concentration may reach 1,000 parts per million, dry basis (ppmd). At normal operating conditions CO will be maintained within 40 ppm.

The induction blower on the baghouses will flow exhaust through the baghouse tall stack at about 38,000 actual cubic feet per minute (acfm). Not all of the stack exhaust flow originates from the incinerator combustion chambers; ambient air is allowed to bleed into the incinerator exhaust ductwork between the incinerator chambers and the baghouses to cool the hot exhaust gases for the protection of the baghouse filters. The cooling air is not a source of CO.

Incinerator Operating Procedures - Incinerator Shut-Down:

Near the end of each burn law enforcement staff breaks up the last of the contraband to be fed into the incinerator to assure complete combustion as the fire begins to die down. Shut-down of the incinerator occurs with cessation of contraband feed into the unit and the conveyor feed-belt is shut down. For approximately the last 30 minutes of each burn incinerator rotation is slowed as the fire diminishes until the fire burns out with contraband fuel depletion. As smoldering ceases the incinerator cools down after about another 30 minutes. The incinerator operator inspects the ash bin during each burn through a slotted view port. After the cool-down period ashes remaining in the combustion chamber are raked into the ash bin. The full ash bin is removed from the unit and is staged for an extended, 5-day cool-down period. Cooled bottom ash is transferred from the ash bin into a waste hopper for disposal.

Since the incinerator operating temperature is high at the end of a burn, TIM anticipates the emission factors associated with unit shut-down will be the same as normal operation except CO emissions could be as high as for the cold-starts. TIM has estimated that at low-load conditions during cold-start operation, the CO concentration may reach 1,000 ppm.

Any excess PM resulting from the smoldering of contraband waste or ash will be controlled by the baghouses since the incinerator building will operate under negative pressure drafted to the baghouses. After the unit has cooled down the baghouse blowers are shut down.

The shut-down emission scenario endures for approximately 1.0 hour at the end of a contraband burn. The anticipated duration of a cold-start (1.0 hours) plus a shutdown (1.0 hour) during each contraband burn cycle is 2.0 hours.

Table 1 – 1-Hour, 3-Hour & 12-Hour Rolling Average CO Emission Rates 2020 w/OOC Record

ROLLING AVG EMISSIONS REPORT

COMPANY:	AMCEP (TIM)
LOCATION:	Tucson AZ.
SOURCE:	Contraband Incinerator
CEMS ID:	1234567
DATE CREATED:	12/24/2020 @13:13
PERIOD:	01/01/2020 00:00 -12/31/2020 23:00 (Annual)

DATE / HOUR	Hrs	SOURCE ON (MINS)	CO @ 7% O ₂ (PPM)	CO @ 7% O ₂ (PPM) 3-hour Rolling Avg	CO @ 7% O ₂ (PPM) 12-hour Rolling Avg	CO @ 7% O ₂ (PPM) OOC adj	CO @ 7% O ₂ (PPM) 3-hour Rolling Avg	CO @ 7% O ₂ (PPM) 12-hour Rolling Avg
01/22/2020 09:00		60	34.3	34.3	24.9	58.5	58.5	58.5
01/22/2020 10:00		31	40.7	37.5	28.0	69.4	64.0	64.0
01/22/2020 11:00		60	84.1	53.0	37.4	143.4	90.4	90.4
01/22/2020 12:00		48	558.2	227.7	111.8	952	388.3	305.8
01/22/2020 13:00		60	27.6	223.3	101.3	47.1	380.8	254.1
01/22/2020 14:00		55	122	235.9	103.6	208.1	402.4	246.4
01/22/2020 15:00		5	0	49.9	93.2	0	85.1	211.2
02/27/2020 08:00		60	10.9	5.5	44.3	18.6	9.3	75.6
02/27/2020 09:00		60	105.8	58.4	59.7	180.4	99.5	101.8
02/27/2020 10:00		60	92	69.6	66.1	156.9	118.6	112.8
02/27/2020 11:00		60	36.3	78.0	61.2	61.9	133.1	104.3
02/27/2020 12:00		60	19.6	49.3	55.2	33.4	84.1	94.2
02/27/2020 13:00		60	16.3	24.1	50.4	27.8	41.0	85.9
02/27/2020 14:00		60	18.5	18.1	46.8	31.6	30.9	79.9
02/27/2020 15:00		58	16.1	17.0	43.8	27.5	29.0	74.6
02/27/2020 16:00		4	40.9	25.2	43.5	69.8	43.0	74.2
04/21/2020 14:00		53	187.8	114.4	54.4	320.3	195.1	92.8
04/21/2020 15:00		60	9.5	98.7	50.3	16.2	168.3	85.9
04/21/2020 16:00		52	40.6	79.3	79.3	69.2	135.2	135.2
04/21/2020 17:00		58	25.8	25.3	65.9	44	43.1	112.4
04/22/2020 08:00		59	11.9	26.1	55.1	20.3	44.5	94.0
04/22/2020 09:00		57	226.6	88.1	83.7	386.4	150.2	142.7
04/22/2020 10:00		60	9.6	82.7	73.1	16.4	141.0	124.7
04/22/2020 11:00		60	6.2	80.8	64.8	10.6	137.8	110.4
04/22/2020 12:00		60	13.1	9.6	59.0	22.3	16.4	100.6
04/22/2020 13:00		60	8.5	9.3	54.0	14.5	15.8	92.0
04/22/2020 14:00		49	8.5	10.0	49.8	14.5	17.1	85.0
05/07/2020 10:00		60	20.6	14.6	37.1	35.1	24.8	63.3
05/07/2020 11:00		60	19.9	20.3	35.6	33.9	34.5	60.7
05/07/2020 12:00		60	10.2	16.9	16.9	17.4	28.8	28.8
05/07/2020 13:00		60	7.9	12.7	14.7	13.5	21.6	25.0
05/07/2020 14:00		60	6	8.0	12.9	10.2	13.7	22.0
05/07/2020 15:00		17	4.7	6.2	11.6	8	10.6	19.7

05/12/2020 09:00		60	15.5	10.1	12.1		26.4	17.2	20.6
05/12/2020 10:00		60	13.8	14.7	12.3		23.5	25.0	21.0
05/12/2020 11:00		60	21.9	17.1	13.4		37.3	29.1	22.8
05/12/2020 12:00		60	20.2	18.6	14.1		34.4	31.7	24.0
05/12/2020 13:00		60	19.9	20.7	13.3		33.9	35.2	22.7
05/12/2020 14:00		60	3.6	14.6	12.4		6.1	24.8	21.1
05/12/2020 15:00		60	4.5	9.3	11.7		7.7	15.9	19.9
05/12/2020 16:00		33	1	3.0	7.3		1.7	5.2	12.4
05/26/2020 12:00		3	14.7	6.7	8.7		25.1	11.5	14.9
05/26/2020 13:00		60	49.1	21.6	15.5		83.7	36.8	26.4
05/26/2020 14:00		60	63.8	42.5	22.4		108.8	72.5	38.1
05/26/2020 15:00		60	37.5	50.1	24.3		64	85.5	41.4
05/26/2020 16:00		29	33.4	44.9	25.3		57	76.6	43.1
05/27/2020 08:00		60	7.7	20.6	23.5		13.1	35.1	40.1
05/27/2020 09:00		60	14.8	11.3	22.7		25.2	19.2	38.8
05/27/2020 10:00		50	16.4	13.0	29.7		28	22.1	50.6
05/27/2020 11:00		48	18.4	16.5	28.4		31.4	28.2	48.5
05/27/2020 12:00		53	16	16.9	27.2		27.3	28.9	46.4
05/27/2020 13:00		43	20	18.1	26.5		34.1	30.9	45.2
06/02/2020 14:00		47	166	93.0	41.9		283.1	158.6	71.5
06/03/2020 10:00		60	118.4	142.2	52.9		201.9	242.5	90.1
06/03/2020 11:00		60	36.9	77.7	50.9		62.9	132.4	86.7
06/03/2020 12:00		60	28.2	61.2	48.3		48.1	104.3	82.4
06/03/2020 13:00		60	44.5	36.5	48.0		75.9	62.3	81.8
06/03/2020 14:00		60	77.3	50.0	70.2		131.8	85.3	119.7
06/03/2020 15:00		48	22.4	48.1	64.2		38.2	82.0	109.5
06/16/2020 08:00		46	14.7	38.1	58.7		25.1	65.0	100.1
06/16/2020 09:00		60	17.5	18.2	54.6		29.8	31.0	93.1
06/16/2020 10:00		56	134.2	55.5	51.8		228.9	94.6	88.3
06/16/2020 11:00		60	38.8	63.5	49.9		66.2	108.3	85.1
06/16/2020 12:00		60	6.7	59.9	44.5		11.4	102.2	75.9
06/16/2020 13:00		60	10.6	18.7	40.7		18.1	31.9	69.5
06/16/2020 14:00		27	6	7.8	37.3		10.2	13.2	63.6
06/17/2020 08:00		60	76.1	41.1	40.8		129.8	70.0	69.6
06/17/2020 09:00		60	19	47.6	38.6		32.4	81.1	65.9
06/17/2020 10:00		56	15.4	36.8	36.0		26.3	62.8	61.5
06/18/2020 08:00		60	142.9	79.2	46.7		243.7	135.0	79.7
06/18/2020 09:00		60	76.5	109.7	66.0		130.5	187.1	112.5
06/18/2020 10:00		60	35.8	85.1	61.0		61.1	145.1	104.0
06/18/2020 11:00		60	5.9	39.4	53.1		10.1	67.2	90.6
06/18/2020 12:00		60	6.2	16.0	47.2		10.6	27.3	80.6
06/18/2020 13:00		60	7.4	6.5	42.8		12.6	11.1	73.0
06/18/2020 14:00		60	6	6.5	39.1		10.2	11.1	66.7
06/18/2020 15:00		60	4.6	6.0	36.0		7.8	10.2	61.4
06/18/2020 16:00		28	45.8	18.8	36.8		78.1	32.0	62.7

06/23/2020 07:00		20	8.8	19.7	34.0
06/23/2020 08:00		60	42.6	32.4	34.8
06/23/2020 09:00		60	35.2	28.9	34.8
06/23/2020 10:00		60	21.2	33.0	26.4
06/23/2020 11:00		60	20.7	25.7	25.6
06/23/2020 12:00		60	6.7	16.2	23.2
06/23/2020 13:00		60	8.3	11.9	21.5
06/23/2020 14:00		17	7.7	7.6	20.2
06/24/2020 08:00		9	29.9	15.3	21.0
06/24/2020 09:00		60	7.5	15.0	19.9
06/24/2020 10:00		60	64.1	33.8	22.4
06/24/2020 11:00		60	31.4	34.3	23.3
06/24/2020 12:00		60	9.4	35.0	22.0
06/24/2020 13:00		7	8.5	16.4	20.9
07-07-2020	7	25	65.5	37.0	23.4
07-07-2020	8	60	43.3	54.4	25.3
07-07-2020	9	60	22.7	43.8	25.4
07-07-2020	10	60	21.3	29.1	26.6
07-07-2020	11	60	10.2	18.1	26.8
07-07-2020	12	60	0.3	10.6	26.2
07-07-2020	13	56	30.1	13.5	26.2
07-09-2020	8	10	138.2	56.2	37.1
07-09-2020	9	60	90	86.1	39.2
07-09-2020	10	60	211.7	146.6	54.3
07-09-2020	11	43	32.5	111.4	56.2
07-21-2020	7	13	245.8	163.3	76.0
07-21-2020	8	60	412.7	230.3	104.9
07-21-2020	9	60	440.6	366.4	138.0
07-21-2020	10	60	382.1	411.8	168.0
07-21-2020	11	60	290.6	371.1	190.4
07-21-2020	12	60	83.7	252.1	196.5
07-21-2020	13	60	55	143.1	201.1
07-21-2020	14	60	14.9	51.2	199.8
07-21-2020	15	54	5.8	25.2	188.8
08-26-2020	10	51	909.3	310.0	257.1
08-26-2020	11	60	291.9	402.3	263.7
08-26-2020	12	4	331.4	510.9	288.7
09-09-2020	10	46	416.7	346.7	302.9
09-09-2020	11	60	142	296.7	280.3
09-09-2020	12	60	60.2	206.3	248.6
09-09-2020	13	60	16.2	72.8	218.1
09-09-2020	14	60	8	28.1	194.6
09-09-2020	15	60	10.2	11.5	188.5
09-09-2020	16	60	12.5	10.2	184.9
09-09-2020	17	22	17.4	15.0	185.1

15	33.6	58.0
72.7	55.3	59.3
60	49.2	59.4
36.2	56.3	45.0
35.3	43.8	43.6
11.4	27.6	39.6
14.2	20.3	36.7
13.1	12.9	34.4
51	26.1	35.9
12.8	25.6	34.0
109.3	57.7	38.1
53.6	58.6	39.7
16	59.6	37.5
14.5	28.0	35.6
111.7	63.1	40.8
73.8	92.8	53.9
38.7	74.7	51.4
36.3	49.6	49.2
17.4	30.8	45.3
0.5	18.1	40.3
51.3	23.1	44.7
235.7	95.8	63.2
153.5	146.8	66.9
361	250.1	92.5
55.4	190.0	95.8
419.2	278.5	129.5
703.8	392.8	178.9
751.4	624.8	235.4
651.6	702.3	286.4
495.6	632.9	324.7
142.7	430.0	335.1
93.8	244.0	342.9
25.4	87.3	340.8
9.9	43.0	321.9
1550.7	528.7	438.4
497.8	686.1	449.8
565.2	871.2	492.3
710.7	591.2	516.6
242.2	506.0	478.1
102.7	351.9	424.0
27.6	124.2	372.0
13.6	48.0	331.9
17.4	19.5	321.4
21.3	17.4	315.4
29.7	25.5	315.7

RATA Passed on 09-10-2020 → Data from 09.16.2020 down not adjusted for OOC rates:

09-10-2020	8	56	15.7	16.6	12.8	26.8	28.3	21.8
09-10-2020	9	60	12.8	15.3	12.8	21.8	26.1	21.8
09-10-2020	10	60	18.8	15.8	13.6	32.1	26.9	23.2
09-10-2020	11	60	5.6	12.4	12.6	9.6	21.2	21.5
09-10-2020	12	60	5.2	9.9	11.8	8.9	16.9	20.1
09-10-2020	13	60	8.4	6.4	11.5	14.3	10.9	19.6
09-10-2020	14	60	6.9	6.8	11.0	11.8	11.7	18.8
09-10-2020	15	60	9.8	8.4	11.2	16.7	14.3	19.1
09-10-2020	16	43	26.7	14.5	12.7	45.5	24.7	21.7
09-16-2020	6	15	11.5	16.0	12.6	11.5	24.6	20.8
09-16-2020	7	60	64.7	34.3	17.0	64.7	40.6	24.5
09-16-2020	8	56	581.6	219.3	116.9	581.6	219.3	122.0
09-16-2020	9	60	175.1	273.8	125.2	175.1	273.8	129.6
09-16-2020	10	15	206.3	321.0	135.3	206.3	321.0	139.2
09-23-2020	9	1	41.2	140.9	124.9	41.2	140.9	128.3
09-23-2020	10	60	161.9	136.5	128.6	161.9	136.5	131.6
09-23-2020	11	60	226.3	143.1	137.5	226.3	143.1	140.2
09-23-2020	12	44	142.9	177.0	137.9	142.9	177.0	140.5
10-27-2020	9	56	2833.3	1067.5	492.6	2833.3	1067.5	492.6
10-27-2020	10	60	1228.9	1401.7	566.2	1228.9	1401.7	566.2
10-27-2020	11	60	101.3	1387.8	524.0	101.3	1387.8	524.0
10-27-2020	12	60	36.1	455.4	483.3	36.1	455.4	483.3
10-27-2020	13	37	23.8	30.0	500.2	23.8	30.0	500.2
11-10-2020	7	4	19	21.4	281.8	19	21.4	281.8
11-10-2020	8	60	59.9	34.2	244.8	59.9	34.2	244.8
11-10-2020	9	60	158.9	79.3	232.6	158.9	79.3	232.6
11-10-2020	10	60	113.8	110.9	217.7	113.8	110.9	217.7
11-10-2020	11	60	19.6	97.4	195.7	19.6	97.4	195.7
11-10-2020	12	60	8.5	47.3	177.0	8.5	47.3	177.0
11-10-2020	13	60	9	12.4	161.7	9	12.4	161.7
11-10-2020	14	59	8	8.5	46.7	8	8.5	46.7
11-17-2020	7	2	11.6	9.5	43.2	11.6	9.5	43.2
11-17-2020	8	55	34.3	18.0	42.4	34.3	18.0	42.4
11-17-2020	9	60	69.7	38.5	44.7	69.7	38.5	44.7
11-17-2020	10	59	39.6	47.9	28.7	39.6	47.9	28.7
11-17-2020	11	60	26	45.1	28.3	26	45.1	28.3
11-17-2020	12	59	13.8	26.5	26.5	13.8	26.5	26.5
11-17-2020	13	60	6.6	15.5	24.3	6.6	15.5	24.3
11-17-2020	14	60	11.4	10.6	23.0	11.4	10.6	23.0
11-17-2020	15	9	493.4	170.5	65.8	493.4	170.5	65.8
11-24-2020	7	2	524.9	343.2	104.0	524.9	343.2	104.0
11-24-2020	8	60	115.1	377.8	144.5	115.1	377.8	144.5
11-24-2020	9	60	25	221.7	132.6	25	221.7	132.6
11-24-2020	10	60	28.6	56.2	123.1	28.6	56.2	123.1
11-24-2020	11	60	7.6	20.4	113.5	7.6	20.4	113.5

11-24-2020	12	60	5.7	14.0	171.5
11-24-2020	13	60	2.7	5.3	150.4
11-24-2020	14	56	2.9	3.8	134.0
12-09-2020	7	3	464.3	156.6	167.0
12-09-2020	8	58	58.8	175.3	157.2
12-09-2020	9	60	59.6	194.2	149.1

5.7	14.0	171.5
2.7	5.3	150.4
2.9	3.8	134.0
464.3	156.6	167.0
58.8	175.3	157.2
59.6	194.2	149.1

09-10-2020	8	56	15.7	16.6	12.8
09-10-2020	9	60	12.8	15.3	12.8
09-10-2020	10	60	18.8	15.8	13.6
09-10-2020	11	60	5.6	12.4	12.6
09-10-2020	12	60	5.2	9.9	11.8
09-10-2020	13	60	8.4	6.4	11.5
09-10-2020	14	60	6.9	6.8	11.0
09-10-2020	15	60	9.8	8.4	11.2
09-10-2020	16	43	26.7	14.5	12.7
09-16-2020	6	15	11.5	16.0	12.6
09-16-2020	7	60	64.7	34.3	17.0
09-16-2020	8	56	581.6	219.3	116.9
09-16-2020	9	60	175.1	273.8	125.2
09-16-2020	10	15	206.3	321.0	135.3
09-23-2020	9	1	41.2	140.9	124.9
09-23-2020	10	60	161.9	136.5	128.6
09-23-2020	11	60	226.3	143.1	137.5
09-23-2020	12	44	142.9	177.0	137.9
10-27-2020	9	56	2833.3	1067.5	492.6
10-27-2020	10	60	1228.9	1401.7	566.2
10-27-2020	11	60	101.3	1387.8	524.0
10-27-2020	12	60	36.1	455.4	483.3
10-27-2020	13	37	23.8	30.0	500.2
11-10-2020	7	4	19	21.4	281.8
11-10-2020	8	60	59.9	34.2	244.8
11-10-2020	9	60	158.9	79.3	232.6
11-10-2020	10	60	113.8	110.9	217.7
11-10-2020	11	60	19.6	97.4	195.7
11-10-2020	12	60	8.5	47.3	177.0
11-10-2020	13	60	9	12.4	161.7
11-10-2020	14	59	8	8.5	46.7
11-17-2020	7	2	11.6	9.5	43.2
11-17-2020	8	55	34.3	18.0	42.4
11-17-2020	9	60	69.7	38.5	44.7
11-17-2020	10	59	39.6	47.9	28.7
11-17-2020	11	60	26	45.1	28.3
11-17-2020	12	59	13.8	26.5	26.5
11-17-2020	13	60	6.6	15.5	24.3
11-17-2020	14	60	11.4	10.6	23.0

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26.8	28.3	21.8
21.8	26.1	21.8
32.1	26.9	23.2
9.6	21.2	21.5
8.9	16.9	20.1
14.3	10.9	19.6
11.8	11.7	18.8
16.7	14.3	19.1
45.5	24.7	21.7
11.5	24.6	20.8
64.7	40.6	24.5
581.6	219.3	122.0
175.1	273.8	129.6
206.3	321.0	139.2
41.2	140.9	128.3
161.9	136.5	131.6
226.3	143.1	140.2
142.9	177.0	140.5
2833.3	1067.5	492.6
1228.9	1401.7	566.2
101.3	1387.8	524.0
36.1	455.4	483.3
23.8	30.0	500.2
19	21.4	281.8
59.9	34.2	244.8
158.9	79.3	232.6
113.8	110.9	217.7
19.6	97.4	195.7
8.5	47.3	177.0
9	12.4	161.7
8	8.5	46.7
11.6	9.5	43.2
34.3	18.0	42.4
69.7	38.5	44.7
39.6	47.9	28.7
26	45.1	28.3
13.8	26.5	26.5
6.6	15.5	24.3
11.4	10.6	23.0

11-17-2020	15	9	493.4	170.5	65.8
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493.4	170.5	65.8
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11-24-2020	7	2	524.9	343.2	104.0
11-24-2020	8	60	115.1	377.8	144.5
11-24-2020	9	60	25	221.7	132.6
11-24-2020	10	60	28.6	56.2	123.1
11-24-2020	11	60	7.6	20.4	113.5
11-24-2020	12	60	5.7	14.0	171.5
11-24-2020	13	60	2.7	5.3	150.4
11-24-2020	14	56	2.9	3.8	134.0
12-09-2020	7	3	464.3	156.6	167.0
12-09-2020	8	58	58.8	175.3	157.2
12-09-2020	9	60	59.6	194.2	149.1
12-09-2020	10	60	18.8	45.7	72.1
12-09-2020	11	60	2.1	26.8	65.1
12-09-2020	12	60	0.1	7.0	59.2
12-09-2020	13	59	0.1	0.8	54.3
		SOURCE ON (HRS)	CO @ 7% (PPM)	CO @ 7% (PPM) 3 hour Rolling Avg	CO @ 7% (PPM) 12 hour Rolling Avg
AVERAGE			94.8	95.8	87.0
TOTAL		153.3			
MIN VALUE			0.0	0.8	7.3
MAX VALUE			2833.3	1401.7	566.2

524.9	343.2	104.0
115.1	377.8	144.5
25	221.7	132.6
28.6	56.2	123.1
7.6	20.4	113.5
5.7	14.0	171.5
2.7	5.3	150.4
2.9	3.8	134.0
464.3	156.6	167.0
58.8	175.3	157.2
59.6	194.2	149.1
18.8	45.7	72.1
2.1	26.8	65.1
0.1	7.0	59.2
0.1	0.8	54.3
CO @ 7% (PPM) ooc adj	CO @ 7% (PPM) 3 hour Rolling Avg	CO @ 7% (PPM) 12 hour Rolling Avg
129.0	130.8	122.3
0.0	0.8	12.4
2833.3	1401.7	566.2

Table 2 – “Out-of-Control” Rolling Average CO Concentrations - 2020 Record

ROLLING AVG EMISSIONS REPORT

COMPANY:	AMCEP
LOCATION:	Tucson AZ.
SOURCE:	Contraband Incinerator
CEMS ID:	1234567
DATE CREATED:	07/25/2020 @20:06
PERIOD:	01/01/2020 00:00 -06/30/2020 23:00

Out-of-Control Rates (CEMS readings x 1.705)



DATE	SOURCE ON (MINS)	CO @ 7% (PPM)	CO @ 7% (PPM) 3 hour Rolling Avg	CO @ 7% (PPM) 12 hour Rolling Avg
01/22/2020 09:00	60	58.5	34.2	30.9
01/22/2020 10:00	31	69.4	64.0	38.6
01/22/2020 11:00	60	143.4	90.4	56.1
01/22/2020 12:00	48	952	388.3	184.1
01/22/2020 13:00	60	47.1	380.8	167.0
01/22/2020 14:00	55	208.1	402.4	171.5
01/22/2020 15:00	5	0	85.1	154.4
02/27/2020 08:00	60	18.6	9.3	75.6
02/27/2020 09:00	60	180.4	99.5	101.8
02/27/2020 10:00	60	156.9	118.6	112.8
02/27/2020 11:00	60	61.9	133.1	104.3
02/27/2020 12:00	60	33.4	84.1	94.2
02/27/2020 13:00	60	27.8	41.0	85.9
02/27/2020 14:00	60	31.6	30.9	79.9
02/27/2020 15:00	58	27.5	29.0	74.6
02/27/2020 16:00	4	69.8	43.0	74.2
04/21/2020 14:00	53	320.3	195.1	92.8
04/21/2020 15:00	60	16.2	168.3	85.9
04/21/2020 16:00	52	69.24	135.2	135.2
04/21/2020 17:00	58	44	43.1	112.4
04/22/2020 08:00	59	20.3	44.5	94.0
04/22/2020 09:00	57	386.5	150.3	142.8
04/22/2020 10:00	60	16.4	141.1	124.7
04/22/2020 11:00	60	10.5	137.8	110.4
04/22/2020 12:00	60	22.3	16.4	100.6
04/22/2020 13:00	60	14.5	15.8	92.0
04/22/2020 14:00	49	14.5	17.1	85.0

05/07/2020 10:00	60	35.1	24.8	63.3
05/07/2020 11:00	60	33.9	34.5	60.7
05/07/2020 12:00	60	17.4	28.8	28.8
05/07/2020 13:00	60	13.5	21.6	25.0
05/07/2020 14:00	60	10.2	13.7	22.0
05/07/2020 15:00	17	8	10.6	19.7
05/12/2020 09:00	60	26.4	17.2	20.6
05/12/2020 10:00	60	23.5	25.0	21.0
05/12/2020 11:00	60	37.3	29.1	22.8
05/12/2020 12:00	60	34.5	31.8	24.0
05/12/2020 13:00	60	33.9	35.2	22.7
05/12/2020 14:00	60	6.1	24.8	21.1
05/12/2020 15:00	60	7.7	15.9	19.9
05/12/2020 16:00	33	1.7	5.2	12.4
05/26/2020 12:00	3	25.1	11.5	14.9
05/26/2020 13:00	60	84.7	37.2	26.5
05/26/2020 14:00	60	108.8	72.9	38.3
05/26/2020 15:00	60	64	85.8	41.5
05/26/2020 16:00	29	57	76.6	43.2
05/27/2020 08:00	60	13.1	35.1	40.2
05/27/2020 09:00	60	25.2	19.2	38.8
05/27/2020 10:00	50	28	22.1	50.7
05/27/2020 11:00	48	31.4	28.2	48.6
05/27/2020 12:00	53	27.3	28.9	46.5
05/27/2020 13:00	43	34.1	30.9	45.3
06/03/2020 10:00	60	201.9	201.9	58.0
06/03/2020 11:00	60	62.9	132.4	58.7
06/03/2020 12:00	60	48.1	104.3	57.4
06/03/2020 13:00	60	75.9	62.3	59.4
06/03/2020 14:00	60	131.8	85.3	92.5
06/03/2020 15:00	48	38.2	82.0	84.7
06/16/2020 08:00	46	25.1	65.0	77.3
06/16/2020 09:00	60	29.8	31.0	72.0
06/16/2020 10:00	56	228.9	94.6	88.3
06/16/2020 11:00	60	66.2	108.3	85.1
06/16/2020 12:00	60	11.4	102.2	75.9
06/16/2020 13:00	60	18.1	31.9	69.5
06/16/2020 14:00	27	10.2	13.2	63.6
06/17/2020 08:00	60	129.8	70.0	69.6
06/17/2020 09:00	60	32.4	81.1	65.9
06/17/2020 10:00	56	26.3	62.8	61.5
06/18/2020 08:00	60	243.7	135.0	79.7
06/18/2020 09:00	60	130.5	187.1	112.5
06/18/2020 10:00	60	61.1	145.1	104.0
06/18/2020 11:00	60	10.1	67.2	90.6
06/18/2020 12:00	60	10.6	27.3	80.6
06/18/2020 13:00	60	12.6	11.1	73.0

06/18/2020 14:00	60	10.2	11.1	66.7
06/18/2020 15:00	60	7.8	10.2	61.4
06/18/2020 16:00	28	78.1	32.0	62.7
06/23/2020 07:00	20	15	33.6	58.0
06/23/2020 08:00	60	72.7	55.3	59.3
06/23/2020 09:00	60	60	49.2	59.4
06/23/2020 10:00	60	36.2	56.3	45.0
06/23/2020 11:00	60	35.3	43.8	43.6
06/23/2020 12:00	60	11.4	27.6	39.6
06/23/2020 13:00	60	14.2	20.3	36.7
06/23/2020 14:00	17	13.1	12.9	34.4
06/24/2020 08:00	9	51	26.1	35.9
06/24/2020 09:00	60	12.8	25.6	34.0
06/24/2020 10:00	60	109.3	57.7	38.1
06/24/2020 11:00	60	53.6	58.6	39.7
06/24/2020 12:00	60	16	59.6	37.5
06/24/2020 13:00	7	14.5	28.0	35.6
	SOURCE ON (HRS)	CO @ 7% O ₂ (PPM)	CO @ 7% O ₂ (PPM) 3 hour Rolling Avg	CO @ 7% (PPM) 12 hour Rolling Avg
AVERAGE		66.2	70.0	66.7
TOTAL	79.7			
MIN VALUE		0.0	5.2	12.4
MAX VALUE		952.0	402.4	184.1

**Table 3 – 1-Hour, 3-Hour & 12-Hour Rolling Average CO Emission Rates 2020 2nd Report Period
w/OOC Record**

ROLLING AVG EMISSIONS REPORT For 2nd Semi Annual Rpt Period

COMPANY:	AMCEP (TIM)
LOCATION:	Tucson AZ.
SOURCE:	Contraband Incinerator
CEMS ID:	1234567
DATE CREATED:	01/24/2021 @15:00
PERIOD:	07/01/2020 00:00 -12/31/2020 23:00 (2 nd Semi-Annual Rpt)

07-07-2020	7	25	65.5	37.0	23.4
07-07-2020	8	60	43.3	54.4	25.3
07-07-2020	9	60	22.7	43.8	25.4
07-07-2020	10	60	21.3	29.1	26.6
07-07-2020	11	60	10.2	18.1	26.8
07-07-2020	12	60	0.3	10.6	26.2
07-07-2020	13	56	30.1	13.5	26.2
07-09-2020	8	10	138.2	56.2	37.1
07-09-2020	9	60	90	86.1	39.2
07-09-2020	10	60	211.7	146.6	54.3
07-09-2020	11	43	32.5	111.4	56.2
07-21-2020	7	13	245.8	163.3	76.0
07-21-2020	8	60	412.7	230.3	104.9
07-21-2020	9	60	440.6	366.4	138.0
07-21-2020	10	60	382.1	411.8	168.0
07-21-2020	11	60	290.6	371.1	190.4
07-21-2020	12	60	83.7	252.1	196.5
07-21-2020	13	60	55	143.1	201.1
07-21-2020	14	60	14.9	51.2	199.8
07-21-2020	15	54	5.8	25.2	188.8
08-21-2020					
08-26-2020	10	51	909.3	310.0	257.1
08-26-2020	11	60	291.9	402.3	263.7
08-26-2020	12	4	331.4	510.9	288.7
09-04-2020					
09-09-2020	10	46	416.7	346.7	302.9
09-09-2020	11	60	142	296.7	280.3
09-09-2020	12	60	60.2	206.3	248.6
09-09-2020	13	60	16.2	72.8	218.1
09-09-2020	14	60	8	28.1	194.6
09-09-2020	15	60	10.2	11.5	188.5
09-09-2020	16	60	12.5	10.2	184.9
09-09-2020	17	22	17.4	15.0	185.1

No Data

No Data

OOC Record:

111.7	63.1	40.8
73.8	92.8	53.9
38.7	74.7	51.4
36.3	49.6	49.2
17.4	30.8	45.3
0.5	18.1	40.3
51.3	23.1	44.7
235.7	95.8	63.2
153.5	146.8	66.9
361	250.1	92.5
55.4	190.0	95.8
419.2	278.5	129.5
703.8	392.8	178.9
751.4	624.8	235.4
651.6	702.3	286.4
495.6	632.9	324.7
142.7	430.0	335.1
93.8	244.0	342.9
25.4	87.3	340.8
9.9	43.0	321.9
1550.7	528.7	438.4
497.8	686.1	449.8
565.2	871.2	492.3
710.7	591.2	516.6
242.2	506.0	478.1
102.7	351.9	424.0
27.6	124.2	372.0
13.6	48.0	331.9
17.4	19.5	321.4
21.3	17.4	315.4
29.7	25.5	315.7

09-10-2020	8	56	15.7	16.6	12.8	RATA Passed	26.8	28.3	21.8
09-10-2020	9	60	12.8	15.3	12.8		21.8	26.1	21.8
09-10-2020	10	60	18.8	15.8	13.6		32.1	26.9	23.2
09-10-2020	11	60	5.6	12.4	12.6		9.6	21.2	21.5
09-10-2020	12	60	5.2	9.9	11.8		8.9	16.9	20.1
09-10-2020	13	60	8.4	6.4	11.5		14.3	10.9	19.6
09-10-2020	14	60	6.9	6.8	11.0		11.8	11.7	18.8
09-10-2020	15	60	9.8	8.4	11.2		16.7	14.3	19.1
09-10-2020	16	43	26.7	14.5	12.7		45.5	24.7	21.7
09-16-2020	6	15	11.5	16.0	12.6	No Further OOC Adjust ↓	11.5	24.6	20.8
09-16-2020	7	60	64.7	34.3	17.0		64.7	40.6	24.5
09-16-2020	8	56	581.6	219.3	116.9		581.6	219.3	122.0
09-16-2020	9	60	175.1	273.8	125.2		175.1	273.8	129.6
09-16-2020	10	15	206.3	321.0	135.3		206.3	321.0	139.2
09-23-2020	9	1	41.2	140.9	124.9		41.2	140.9	128.3
09-23-2020	10	60	161.9	136.5	128.6		161.9	136.5	131.6
09-23-2020	11	60	226.3	143.1	137.5		226.3	143.1	140.2
09-23-2020	12	44	142.9	177.0	137.9		142.9	177.0	140.5
09-25-2020						No Data			
10-27-2020	9	56	2833.3	1067.5	492.6		2833.3	1067.5	492.6
10-27-2020	10	60	1228.9	1401.7	566.2		1228.9	1401.7	566.2
10-27-2020	11	60	101.3	1387.8	524.0		101.3	1387.8	524.0
10-27-2020	12	60	36.1	455.4	483.3		36.1	455.4	483.3
10-27-2020	13	37	23.8	30.0	500.2		23.8	30.0	500.2
11-03-2020						No Data			
11-10-2020	7	4	19	21.4	281.8		19	21.4	281.8
11-10-2020	8	60	59.9	34.2	244.8		59.9	34.2	244.8
11-10-2020	9	60	158.9	79.3	232.6		158.9	79.3	232.6
11-10-2020	10	60	113.8	110.9	217.7		113.8	110.9	217.7
11-10-2020	11	60	19.6	97.4	195.7		19.6	97.4	195.7
11-10-2020	12	60	8.5	47.3	177.0		8.5	47.3	177.0
11-10-2020	13	60	9	12.4	161.7		9	12.4	161.7
11-10-2020	14	59	8	8.5	46.7		8	8.5	46.7
11-13-2020						No Data			
11-17-2020	7	2	11.6	9.5	43.2		11.6	9.5	43.2
11-17-2020	8	55	34.3	18.0	42.4		34.3	18.0	42.4
11-17-2020	9	60	69.7	38.5	44.7		69.7	38.5	44.7
11-17-2020	10	59	39.6	47.9	28.7		39.6	47.9	28.7
11-17-2020	11	60	26	45.1	28.3		26	45.1	28.3
11-17-2020	12	59	13.8	26.5	26.5		13.8	26.5	26.5
11-17-2020	13	60	6.6	15.5	24.3		6.6	15.5	24.3
11-17-2020	14	60	11.4	10.6	23.0		11.4	10.6	23.0
11-17-2020	15	9	493.4	170.5	65.8		493.4	170.5	65.8

11-17-2020	11	60	26	45.1	28.3
11-17-2020	12	59	13.8	26.5	26.5
11-17-2020	13	60	6.6	15.5	24.3
11-17-2020	14	60	11.4	10.6	23.0
11-17-2020	15	9	493.4	170.5	65.8
11-24-2020	7	2	524.9	343.2	104.0
11-24-2020	8	60	115.1	377.8	144.5
11-24-2020	9	60	25	221.7	132.6
11-24-2020	10	60	28.6	56.2	123.1
11-24-2020	11	60	7.6	20.4	113.5
11-24-2020	12	60	5.7	14.0	171.5
11-24-2020	13	60	2.7	5.3	150.4
11-24-2020	14	56	2.9	3.8	134.0
12-01-2020					
12-09-2020	7	3	464.3	156.6	167.0
12-09-2020	8	58	58.8	175.3	157.2
12-09-2020	9	60	59.6	194.2	149.1
12-09-2020	10	60	18.8	45.7	72.1
12-09-2020	11	60	2.1	26.8	65.1
12-09-2020	12	60	0.1	7.0	59.2
12-09-2020	13	59	0.1	0.8	54.3
12-18-2020					
		SOURCE ON (HRS)	CO @ 7% (PPM)	CO @ 7% (PPM) 3 hour Rolling Avg	CO @ 7% (PPM) 12 hour Rolling Avg
AVERAGE			153.2	153.3	136.5
TOTAL		72.9			
MIN VALUE			0.1	0.8	11.0
MAX VALUE			2833.3	1401.7	566.2

No Data

No Data

26	45.1	28.3
13.8	26.5	26.5
6.6	15.5	24.3
11.4	10.6	23.0
493.4	170.5	65.8
524.9	343.2	104.0
115.1	377.8	144.5
25	221.7	132.6
28.6	56.2	123.1
7.6	20.4	113.5
5.7	14.0	171.5
2.7	5.3	150.4
2.9	3.8	134.0
464.3	156.6	167.0
58.8	175.3	157.2
59.6	194.2	149.1
18.8	45.7	72.1
2.1	26.8	65.1
0.1	7.0	59.2
0.1	0.8	54.3
CO @ 7% (PPM) ooc adj	CO @ 7% (PPM) 3 hour Rolling Avg	CO @ 7% (PPM) 12 hour Rolling Avg
193.6	194.0	174.5
0.1	0.8	18.8
2833.3	1401.7	566.2